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The Role of Advertising Expenditure in Measuring Indonesia's Money Demand Function

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ABSTRACT

Using the consumer theory approach as suggested by Habibullah (2009), this study aims to shed new light on monetary authority by incorporating advertising expenditure, a variable that has been neglected in the past, into study of the money demand function in Indonesia. In addition, different measurements of monetary aggregates (simple-sum and Divisia money) have been used in the estimation to provide better insight into the selection of a suitable monetary policy variable for the case of Indonesia. Empirical findings from the error-correction model (ECM) indicate that the advertising expenditure variable has a significant impact on the demand for money. Furthermore, as compared to simple-sum money, the model that used Divisia monetary aggregates rendered more plausible estimation results in the estimation of money demand function.

Keywords: Advertising Expenditure, Divisia Money, Money Demand

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INTRODUCTION

Over the centuries, numerous crises have shaken the world's economies and financial systems, including those of Indonesia. Compared with neighboring countries that have also endured crises, the recovery evolution in Indonesia has been slightly sluggish. A famous economist, Benjamin Higgins, depicted Indonesia as "the number one failure among the major undeveloped countries". To escape from the journey of crisis, economic reforms connected to economic policy as well as political stability are important. Moreover, the revolution from economic crisis to economic reform required the injection of money into all economic activities. Indisputably, the sustainability and development of a nation's economy will be dampened without a sufficient money supply. In contrast, overabundance of money supply will create inflationary pressure whereby it possibly will undervalue the value of money. Therefore, central banks need to know the amount of money demanded by the economy before making any decision on how much of the money supply it will channel into the market. As stated by Puah *et al*. (2010), changes in money supply will impinge on liquidity in the market. Thus, a well-balanced amount of money in a nation is critical to ensuring market liquidity and it may perhaps stimulate economic growth. However, it is imperative to highlight that the rapid financial reforms influenced the stability of the money demand function.

An Overview of Monetary Policy in Indonesia

In the past three decades, the major focus of monetary policy instruments in Indonesia has been inflation targeting, exchange rate targeting, and interest rate targeting. Since 1970, at least three exchange rate systems have been implemented: fixed exchange rate system (1970-1978), floating exchange rate system (1979-1982; 1987-1996), and free floating exchange rate system since August 14, 1999. In the 1980s, interest rate targeting took place for roughly five years (1983-1987). During the Asian financial crisis, the base money was used as the operational instrument to control others' monetary aggregates (i.e., broad money). Per the Central Bank Act of 1999, the Bank of Indonesia (BI) has enjoyed independence and a position as the only authority in monetary policy

implementation in Indonesia. BI has had the mandate to pursue currency stability.[1] To combat inflationary pressures in Indonesia, BI adopted inflation targeting in 2000. With the aim of output stabilization, some form of inflation targeting regime such as Inflation Targeting Lite was employed from 2000 through 2004. Subsequently, full-fledged (flexible) inflation targeting was adopted in 2005.

The use of inflation targeting in developing countries has been criticized by researchers such as Masson *et al*. (1998), Fraga *et al*. (2004), and Daianu and Lungu (2007). Masson *et al*. (1998) contended that inflation targeting can only act as a good monetary policy instrument in some middle- to high-income countries. Meanwhile, Fraga *et al*. (2004) and Daianu and Lungu (2007) argued that the implementation of inflation targeting in emerging economies carried more challenges than in advanced economies. This is because some of the central banks in emerging countries lack credibility and, thus, do not have the ability to achieve the predetermined inflation targets or low and stable inflation in the long run (Syurkani, 2010). In several financial crises, such as fluctuations in international crude oil prices, the Asian financial crisis, and the subprime mortgage crisis, BI faced inflationary pressure during the implementation of inflation targeting. This signifies that the inflation targeting policy was not fully achieved in the case of Indonesia.

The conduct of monetary policy plays an important role in a fast-growing economy like Indonesia. Via control of monetary policy variables like money supply and interest rates, the monetary authority can affect the liquidity in financial markets and, hence, the investment activities and aggregate output of the country. In view of this, the identification of a stable and well-defined money demand function is crucial as it will provide useful information to the monetary authority in devising an effective monetary policy. Since the Divisia monetary aggregate is less affected by the financial reforms and thus able to maintain a close relationship with real economic activity, Habibullah (1998) claimed that the Divisia monetary aggregate has the potential to act as a useful intermediate indicator in the conduct of monetary policy in Indonesia. To further affirm the significance of the Divisia monetary aggregate as an imperative monetary instrument

[1]Refer to price stability and exchange rate stability.

in Indonesia, the present study compares the relative performance of traditional simple-sum and Divisia monetary aggregates in estimating the Indonesian money demand function. In addition, this study incorporates an advertising expenditure variable as a new explanatory variable in the money demand equation. The rationale of using advertising expenditure in estimating the demand for money is further explained in the following section.

RELEVANCE OF ADVERTISING EXPENDITURE

Specifically, advertising acts as the information provider for consumers about goods and where to acquire them; thus, it reduces the search cost and increases consumers' transaction demand for money toward the advertised products. Saving (1971, p. 407) documented that "... the lack of consideration of transaction cost and its effect on consumer behavior has led to a rather strained explanation of why individuals use or hold money. Such explanations sometimes involve arbitrary payment schedules, balanced portfolios or perhaps simply a throwing up of the hands and saying that the utility function contains money holding as an argument." The same argument can be applied to the role of advertising in affecting consumers' purchasing behavior and consequently increasing their holding of money for transaction purposes. On the other hand, Chamberlin (1933) and Boulding *et al*. (1992) claimed that advertising will cause the demand curve for the selected advertised product to shift to the right or upward. This also signifies that demand for real money balances will increase as demand for the advertised product increases.

In the extensive theoretical and empirical studies to inspect the relationship between advertising expenditure and demand elasticity, Morris and Langenfeld (1992) stated that advertising could provide valuable information to consumers and hence increase the elasticity of demand, thereby raising demand for output in the market. On the other hand, Zhang and Sexton (2002), Kinnucan (2003), and Kinnucan and Zheng (2005) found that the impact of advertising on demand elasticity is essential in maximizing consumer

spending and firm profitability. Therefore, it is important to emphasize the impact of advertising expenditure on consumers' spending behavior, which creates movement on demand elasticity and boosts demand for money for transaction purposes. Nevertheless, the elasticity of advertising's repercussion on money demand in different countries is undefined and the role of advertising expenditure in affecting the money demand function is still unexplored. For this reason, this study empirically examined the role of advertising expenditure in the money demand function for Indonesia via the consumer demand theory proposed by Habibullah (2009) using alternative monetary aggregates.

SIMPLE-SUM VERSUS DIVISIA MONETARY AGGREGATES

The main criticism of simple-sum monetary aggregates derives from the fact that these aggregates are formed together with the heterogeneous financial assets or by a simple summation of the dollar amounts of monetary assets. In the same vein, Barnett (1980), Drake and Mills (2002; 2005), and Drake and Fleissig (2006) stated that all financial assets in simple-sum monetary aggregates are assumed to be equal and attached in a unitary weight. As a result, the assumption of perfect substitutes for all financial assets is inappropriate (see Thornton and Yue, 1992; Yu and Tsui, 2000; Darrat *et al*., 2005). In fact, only a single asset would be chosen by a rational consumer if the user cost for all the assets is equal under the microeconomic demand theory (Anderson *et al*., 1997b). Based on the above arguments, one can see that the construction of simple-sum money is inconsistent with the theories of index number and utility; consequently, the flow of monetary services cannot be captured by the conventional simple-sum aggregation.

In consideration of the deficiencies of simple-sum monetary aggregates, the use of Divisia monetary aggregates was proposed by Barnett (1980). This aggregation is based on a strong theoretical foundation, that is, the microeconomic model of the economic agents' decision making instead of statistical calculation. Since financial assets are not a perfect substitute, different monetary services provided via each of the assets in a non-linear aggregation should align with different weights corresponding to their "moneyness"

in obtaining an appropriate monetary aggregate (Barnett, 1980; Habibullah *et al*., 2000; Puah *et al*., 2008). In particular, higher weight should be assigned to the financial asset with higher "moneyness" or more frequently employed for transaction purposes since the opportunity cost is higher, and vice versa. Thus, the Divisia monetary aggregation is actually a measure of the monetary services flow. Indisputably, the Divisia monetary aggregate outperforms its conventional simple-sum counterpart (e.g., Barnett *el al*., 1984) since it is consistent with microeconomic theory. However, the empirical validity of the use of the Divisia monetary aggregate is still a debatable issue in macroeconomic studies and subject to additional empirical support.

MODEL SPECIFICATION

Divisia Monetary Aggregates

To construct Divisia monetary aggregates, this study follows the approach proposed by Barnett (1980), which was further extended by Anderson *et al*. (1997a). As mentioned earlier, the Divisia monetary aggregate is computed based on a strong theoretical foundation. In this case, the decision making by economic agents in the microeconomic model is taken into account. The total expenditure (Y) on monetary assets at time t is expressed in Equation (1) with the assumption of the economic agents' attempt to maximize their utility but subject to budget constraints:

$$Y_t = \sum_{i=1}^{n} \pi_{it} \overline{m}_{it} \tag{1}$$

where π_{it} is the user cost of monetary asset i at time t and $\overline{m}_{it}$ is the stock of monetary asset i in optimum at time t. Next, Equation (2) refers to the expenditure share on monetary asset i at time t:

$$E_{it} = \frac{\pi_{it} \overline{m}_{it}}{Y_t} \tag{2}$$

given that the total user cost of the optimal monetary aggregates is divided by the total expenditure. The user costs (opportunity costs of holding monetary assets) are the interest rate (liquidity of the monetary asset) differentials between the benchmark asset return rate and the own monetary asset's return rate; it can be written as (see Barnett, 1978):

$$\pi_{it} = \frac{\bar{p}_t \left(R_t - r_{it} \right)}{\left(1 + R_t \right)} \tag{3}$$

where R_{it} is the benchmark asset return rate (highest return rate of a risk-free monetary asset that does not provide any monetary services) and r_{it} is the own monetary asset's return rate. The consumer price index (CPI) is represented by $\bar{p}_t$.

The Divisia quantity index proposed by Barnett (1980) to formulate Divisia monetary aggregates (DM) is as follows:

$$DM_t = DM_{t-1} \prod_{i=1}^{n} \left(\frac{\bar{m}_{it}}{\bar{m}_{i,t-1}} \right)^{\bar{E}} \tag{4}$$

where $\bar{E}_{it}$ is the average of the sum of E_{it} and E_{it-1}, which can be described as:

$$\bar{E}_{it} = \frac{1}{2} \left(E_{it} + E_{i,t-1} \right) \tag{5}$$

Money Demand Model

In the most basic form, real money demand is a function of a scale variable (real income or real wealth) and the opportunity cost of holding money (interest rate or inflation rate). Therefore, the traditional real money demand function can be expressed as:

$$RMd_t = f(Y_t, i_t) \tag{6}$$

In the large body of empirical research on money demand (e.g., Yu & Gan, 2009; Lestano *et al*., 2009; Achsani, 2010), real gross domestic product (GDP) was employed as the scale variable although consumption, final expenditure, and wealth also have been used as alternative measures for the level of transactions in the economy. As estimated by Oberman *et al*. (2012), there will be an increase of 90 million additional consumers with considerable spending power by 2030 in Indonesia. The increase in the number of high purchasing power consumers will definitely be able to stimulate the economy and lead to higher demand for money. In addition to China and India, Indonesia is expected to reach a level of consumption that is stronger than in other nation (Oberman *et al*., 2012). In this regard, real household private consumption can be utilized as the scale variable of money demand function specification in Indonesia.

To promote the efficiency of monetary policy, the response of both foreign interest rates and exchange rates should be taken into account in domestic money holding (Arize *et al*., 1990). Furthermore, a monetization variable should be incorporated into Indonesia's money demand function because the financial reforms had taken place by the time under study. This is mainly because the variable of monetization can be used to capture the effect of financial development (Puah *et al*., 2008). Moreover, the classic money demand specification can be extended with the inclusion of advertising expenditure in view of the fact that advertising expenditure can affect the level of consumption (Schmalensee, 1972; Taylor & Weiserbs, 1972) and may contribute to economic growth more than its expenditure's share or spending (Bughin & Spittaels, 2012). This also signifies that advertising expenditure may enhance the money demand for consumption purposes through the transaction motive and ultimately stimulate economic growth.

Based on the discussion above, the money demand function for the present study can be defined as:

$$RMd_t = f\,(RCONS_t, MMR_t, TBRUS_t, EXC_t, MONET_t, AD_t) \qquad (7)$$

where RMd is real money balances - either simple-sum monetary aggregates M1 (SSM1) or M2 (SSM2), or Divisia monetary aggregates M1 (DM1) or M2 (DM2); RCONS is real private household consumption; MMR is nominal domestic interest rate which is proxied by money market rate; TBRUS is foreign interest rate which is proxied by U.S. Treasury bill rate, EXC is nominal exchange rate; MONET represents the monetization variable;[2] and AD is advertising expenditure.

DATA AND METHODOLOGY

In this study, the sample period covered quarterly data from 1984 through 2009. All the related data were extracted from the *International Financial Statistics* (IFS) published by the International Monetary Fund (IMF) except for the data on Divisia monetary aggregates[3] and advertising expenditure.[4] The real term of monetary aggregates and consumption were obtained by dividing the variables by CPI at the base year of 2005. Before proceeding to develop further estimations, all the variables were transformed into natural logarithm form. In the empirical estimation, a series of econometric testing procedures, namely, augmented Dickey-Fuller (ADF) unit root test, Johansen-Juselius (1990) multivariate cointegration test, vector error-correction estimation, and the Granger causality tests based on error-correction model (ECM) were employed to estimate the newly derived money demand function for Indonesia.

[2]Monetization is the ratio of quasi money (M2 minus M1) to GDP. Since the stock of money is computed with different measures of money, the monetization is broken into two, that is, monetization for simple-sum monetary aggregates (MONETSSM) and monetization for Divisia monetary aggregates (MONETDM).
[3]The data for Divisia monetary aggregates were constructed by the authors.
[4]Advertising data were collected from Nielsen, Zenith Media Worldwide, and WARC.

EMPIRICAL FINDINGS

First, we employed the ADF unit root test to detect the stationary properties of the variables under study. Empirical findings indicated that all the variables were stationary at first difference, signifying that cointegration testing could proceed in the next stage.[5] Table 1 reports the Johansen-Juselius cointegration test results. Only a single cointegrating vector was found in all of the four money demand models.[6] In view of this, one can conclude that a stable long-run equilibrium relationship exists among the specified variables in all the models.

Table 1: Johansen and Juselius Cointegration Test Results

		Maximum Eigenvalue Test (λ-max)				
H_0	**H_1**	**SSM1 (r = 2)**	**SSM2 (r = 2)**	**DM1 (r = 2)**	**DM2 (r = 2)**	**95% CV**
r = 0	r = 1	65.071**	84.597**	50.406**	47.027**	46.231
r = 1	r = 2	36.878	33.974	45.229	37.042	40.078
r = 2	r = 3	26.109	23.988	24.272	23.760	33.877
r = 3	r = 4	18.522	21.350	19.211	15.080	27.584
r = 4	r = 5	12.223	10.503	11.171	12.936	21.132
r = 5	r = 6	7.258	7.666	7.376	7.858	14.265
r = 6	r = 7	0.016	2.023	2.847	3.063	3.841

Notes: r is the number of cointegration vectors. Asterisks (**) indicate significant at the 5% level. Lag selection is based on Akaike Information Criterion (AIC). The reported maximum eigenvalue statistics have been adjusted for small sample size correction using Reinsel and Ahn (1988)'s formula: (t-nk/t)*lr; where t = actual sample size used in the estimation, n = number of variables in the system, k = number of lags used and lr = log likelihood ratio.

Accordingly, Table 2 depicts the results of normalizing coefficients of real money demand for the SSM1, SSM2, DM1, and DM2 models. For simple-sum money demand models, the coefficient of real consumption is over parameter in the SSM1 model and the domestic interest rate is insignificant. Meanwhile, advertising expenditure exhibited an incorrect coefficient sign. As for the SSM2 model, real consumption was statistically insignificant. When we examined the Divisia money demand models, although all variables were statistically significant at the 1% level in the DM1 model, advertising expenditure demonstrated an incorrect sign. Results showed that a well-defined and

[5]To conserve space, the ADF unit root test results are not presented here. However, these results are available from the authors upon request.

[6]In this study, only the maximum eigenvalue test is presented since Johansen and Juselius (1990) mentioned that the maximum eigenvalue test could generate more robust results and is more powerful than the Trace test.

credible money demand function only existed in the DM2 money demand equation since DM2 can generate plausible coefficients which are statistically significant and consistent with the *a priori* hypothesis of the money demand model. Equation (8) illustrates the DM2 money demand function in Indonesia:

$$LRDM2 = 3.531 + 0.464LRCONS - 0.031LMMR + 0.049LTBRUS - 0.010LEXC + 0.622LMONETDM + 0.115LAD \quad (8)$$

Table 2: Vector Error Correction Estimates

Test for Exclusion		**b_1**	**b_2**	**b_3**	**b_4**	**b_5**	**b_6**	**b_7**
Parameter Estimated	**Constant**	**LRSSM1**	**LRCONS**	**LMMR**	**LTBRUS**	**LEXC**	**LMONETSSM**	**LAD**
Elasticities [t-statistic]	0.600	-1.000	2.533 [6.922]***	-0.098 [-0.856]	-0.872 [-10.586]***	-0.180 [-2.821]***	0.459 [6.277]***	-0.751 [-5.925]***
Parameter Estimated	**Constant**	**LRSSM2**	**LRCONS**	**LMMR**	**LTBRUS**	**LEXC**	**LMONETSSM**	**LAD**
Elasticities [t-statistic]	5.612	-1.000	0.070 [1.664]	-0.114 [-9.385]***	-0.023 [-3.027]***	0.015 [1.707]*	0.832 [91.0665]***	0.199 [15.248]***
Parameter Estimated	**Constant**	**LRDM1**	**LRCONS**	**LMMR**	**LTBRUS**	**LEXC**	**LMONETDM**	**LAD**
Elasticities [t-statistic]	1.451	-1.000	0.870 [13.515]***	-0.053 [-5.325]***	0.066 [9.757]***	-0.023 [-5.045]***	0.262 [33.520]***	-0.039 [-2.045]***
Parameter Estimated	**Constant**	**LRDM2**	**LRCONS**	**LMMR**	**LTBRUS**	**LEXC**	**LMONETDM**	**LAD**
Elasticities [t-statistic]	3.531	-1.000	0.464 [8.484]***	-0.031 [-3.759]***	0.049 [7.877]***	-0.010 [-1.961]**	0.622 [92.072]***	0.115 [7.375]***

Notes: Asterisks (*), (**) and (***) indicate significant at 10%, 5% and 1%, respectively. Figures in parentheses are the t-statistics.

Equation (8) indicates that Indonesia's money demand is inelastic with respect to all of its determinants. As expected, RCONS exerts a significant positive impact on the demand for money; when private consumption increases, it will induce the multiplier effect in the process of income propagation, subsequently leading to higher demand for money for transaction purposes. In line with Puah and Hiew (2010), domestic interest rate and money demand were negatively related, while foreign interest rate and money demand were moving in the same direction. An increase of holding foreign currency's opportunity cost will lead to the holding for domestic money and withdrawal of foreign

currency rising together (Heung, 1998). This also implies that an imperfect substitution exists among domestic and foreign money. Certainly, a high foreign interest rate will lead the borrowing cost to increase, and consequently increase the domestic money balance demand. Based on the coefficient parameter for both interest rates, the long-run DM2 demand for money is more responsive to foreign interest rate since its coefficient is slightly higher than the domestic interest rate.

The negative relationship between the nominal exchange rate and money demand indicates that the depreciation of domestic currency will weaken the holding of domestic currency by investors since they may decide to hold more foreign currency as they expect the Rupiah to further depreciate. In addition, money balances are also being substituted for physical assets (Abdullah *et al*., 2010). Thus, the argument of currency substitution effect has been supported. Nevertheless, the demand for money was not greatly affected by changes in the nominal exchange rate. On the other hand, consistent with Kot (2004), Puah *et al*. (2008), and Leong *et al*. (2010), DM2 money and the monetization variable are positively related. Moreover, monetization shows the highest coefficient parameter, 0.622, which also means that when the financial market becomes more liberalized, a strong demand for money is required to support development in the financial markets and other economic sectors. Based on Equation (8), advertising expenditure may tempt a positive relationship with demand for money. This is consistent with Saving's (1971) finding in which he stated that advertising expenditure can reduce consumers' search costs and increase market demand. Consequently, an increase in market demand will increase the holdings for money associated with transaction motives.

Table 3: ECM Granger Causality Tests and Diagnostic Tests Results

	LRSSM1	LRSSM2	LRDM1	LRDM2
		F-statistics (*p*-value)		
LRCONS	14.339(0.000)***	10.400(0.000)***	6.395(0.000)***	4.841(0.003)***
LMMR	13.200(0.000)***	10.094(0.000)***	12.940(0.000)***	6.059(0.000)***
LTBRUS	17.588(0.000)***	19.593(0.000)***	8.235(0.000)***	6.445(0.003)***
LEXC	10.283(0.000)***	6.923(0.000)***	6.211(0.000)***	2.215(0.098)*
LMONET	12.902(0.000)***	15.895(0.000)***	21.221(0.000)***	6.405(0.000)***
LAD	20.964(0.000)***	3.033(0.038)**	9.162(0.000)***	9.034(0.000)***
		Coefficients[*t*-statistics]		
ECT	-0.192[-9.117]***	-0.844[-7.200]***	-0.552[-5.329]***	-0.985[-4.289]***
Diagnostics Test:				
JB	6.032(0.049)**	2.327(0.312)	10.201(0.006)***	2.728(0.256)
AR [4]	1.049(0.394)	0.302(0.875)	2.121(0.090)*	0.201(0.937)
ARCH [1]	0.024(0.878)	0.588(0.445)	1.791(0.184)	0.930(0.337)
RESET [1]	1.079(0.304)	1.946(0.170)	1.432(0.236)	0.960(0.332)
CUSUM	Stable	Stable	Stable	Stable
$CUSUM^2$	Stable	Stable	Stable	Stable

Notes: Asterisks (***), (**) and (*) indicate significant at 1%, 5% and 10%, respectively. Figures in parentheses are the *t*-statistics. LMONET for simple-sum monetary aggregates is LMONETSSM, meanwhile LMONET for Divisia monetary aggregates is LMONETDM.

In the following stage, we examined the causality and statistical properties of each money demand model. Empirical results in Table 3 imply that causality runs from all the explanatory variables to the monetary variables. Furthermore, the error-correction term (ECT) of all the money demand models is statistically significant and less than negative one, supporting the existence of a cointegration relationship. Compared to other money demand models, the DM2 model has the faster speed of adjustment toward long-run equilibrium. In terms of the goodness of fit, diagnostic test results in Table 3 show that even though all the models are stable over time, only the SSM2 and DM2 models are free from normality, serial correlation, heteroskedasticity, and misspecification problems. In sum, the DM2 model performs better than other money demand models as it does not suffered from any model deficiency problem and it has the fastest speed of adjustment to correct for disequilibrium.

CONCLUSION

A stable and well-defined money demand function plays an important role in formulating an appropriate monetary policy. In addition, the fundamental flaw of simple-sum monetary aggregates has motivated the researchers to examine the relative performance of simple-sum and Divisia monetary aggregates. Although both the broader monetary aggregate models (SSM2 and DM2) passed all the diagnostic tests, DM2 is superior to SSM2 because the DM2 model exhibited well-defined money demand properties and it has a faster speed of adjustment toward long-run equilibrium. Certainly, the superiority of Divisia monetary aggregates may shed new light on their use in conducting monetary policy in Indonesia. This study also noted the statistical significance of both domestic and foreign interest rates, real private household consumption, and exchange rate in the DM2 money demand model. The findings suggest that these variables have important implications for the effectiveness of monetary policy in Indonesia. In addition, the study fills the gaps in our understanding of the nexus between advertising expenditure and money demand. The findings indicate that advertising expenditure can be an important factor in the demand for money since inclusion of this variable generated a stable and well-specified money demand function. Advertising expenditure has been neglected in most previous studies and its elasticity is undefined in most countries. Our findings suggest that this variable is statistically significant and positively related to the demand for money. Therefore, the present paper adds structure to the empirical literature on the relationship between advertising expenditure and money demand, and this variable can be used as an explanatory variable in estimation of the money demand function in future research.

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