

DOES PRODUCT DIVERSIFICATION MATTER ON CAPITAL STRUCTURE DECISIONS? AN EMPIRICAL STUDY OF MANUFACTURING COMPANIES IN INDONESIA

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Abstract: *Up till present, there is no convergence conclusion about the relation of product diversification and capital structure. There are three kinds of empirical finding of the relationship: there is positive significance, there is negative significance, and there is not significance. This study aims to examine the influences of product diversification on capital structure decisions. We employ a panel data from 83 companies of 13 manufacturing industries that listed in IDX covering the period 2001 – 2010. We find that both variables: the category of product diversification (CPD) and the degree of relatedness of product diversification (DRD) has a significant negative influence on the capital structure. This finding clearly supports the agency theory.*

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INTRODUCTION

Diversification is one of the strategies executed by a firm in facing the competition in business. The diversification defines as business varieties, either related or unrelated businesses. In the discussion about the relations between the diversification and the capital structure decision, there are two main issues to be taken into consideration. The first issue is the categories of the diversifications that has a tendency to be funded by the certain fund, and the second issue is the relations between the diversification level and the leverage level.

In the first issue, some experts agree that the categories of diversification (related and unrelated) are strongly linked to the resources characteristics that are controlled by the firm. A firm that operate in a related business is considered having better potential to increase its firm's value compared to a firm doing the

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unrelated business. Therefore, it will be more likely to add more specific assets rather than general assets. The specific assets are appropriate to be funded by an internal fund rather than by an external one (debt).

Further, several scholars examine the degree of relatedness of the diversification. However, in the discussion, there hasn't been any agreement on the matter mentioned above, and even there are two divergence conclusions on the influence of the diversification on the capital structure. The first group concludes that the higher the degree of relatedness, the higher the capital structure. In another side, the higher the degree of relatedness of the firm diversification, the lower the capital structure. This research aims to examine the relations between both variables: the diversification category and the degree of relatedness on the capital structure.

THEORETICAL REVIEW

The researchers compared the diversified firms (conglomerates) operating some divisions in multiple industries to the undiversified firms. It became significant attention to the recent years (Lyandres, 2007). The comparative results provided two short of conglomerates, i.e. conglomerate discounts (Lang & Stulz, 1994; Berger & Ofek, 1995; Lins & Servaes, 1999; Klein, 2001) and conglomerates premiums (Campa & Kedia, 2002; Villalonga, 2003). Regardless the debate on conglomerate issues, either the discount or the premiums, there is an agreement on the excess of the conglomerate firms compared to those of single operate. That excess is relied upon the cost & benefit of the diversification.

In this vein, both in the finance and the strategic management literature, at least, there are five benefits and costs of the diversification. The benefits are: 1) operating efficiency that is gained from the economical of scope, 2) taking the advantages of the tax caused by the smoothing of the profit stream, 3) mitigating any under investment problems (Myers, 1977) by creating a wider internal stock market, 4) reducing the possibilities of bankruptcy (Lewellen, 1971), and 5) increasing the ability of the division to prey on the competitors (Bolton & Scharfesstein, 1990). Lyandres (2007) stated the cost of the conglomerate was identified mostly by the agency conflicts between the managers and the shareholders, i.e. :1) having free cash flow problem (Jensen, 1986, 1988), 2) having managerial risk aversion (Amihud & Lev, 1981), 3) rent-seeking by divisional managers that cause investment distortion (Rajan, Servaes, and Zingales, 2000), 4) having costs that can lead transfer inefficiency among conglomerates' divisions (Rajan, Servaes & Zingales, 2000), and 5) serving managers empire building objective, given the antitrust opposition to horizontal and vertical mergers.

Based on the theory of Structure Conduct Performance (SCP), the decision causing the excess in the firms' performance is usually influenced and does

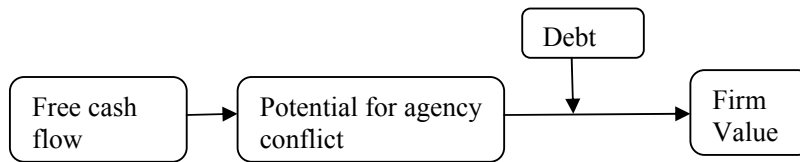
influence the decision on the firms' capital structure. The next query is what are the relations between the capital structure and the diversifications strategy?

In the early work of Modigliani and Miller (1958), they state that the firm's capital structure was irrelevant with some basic assumptions. It means that the use of debt or equity will not influence the value of the firms. The theory implies that the financial decision is irrelevant to the strategic decision. However, later this theory receive some denials from the researchers, because the irrelevance of some assumptions of the perfect market becomes the basic thought such as the absence of taxes, the absence of transaction costs and the absence of asymmetric information among actors in the market. By losing the assumptions of MM, the latter studies develop the agency approach, asymmetric informational approach, and capital structure model based on tax considerations whereas each of them concludes that the capital structure is relevant to the firm's value. The development of these theories has led the scholars to discuss the relation between the diversification and the capital structure since the 1970s.

The strategic management scholars also pay more attention to the relations between the capital structure and strategy by using the relevance of capital structure to the value of firms as the basis. They view that capital structure decision are important from a strategic perspective and supposed to be the domain of any strategic management researchers (Bromiley, 1990; Sandberg, Lewellen, & Stanley, 1987). Furthermore, the capital structure also influences the firm's competition ability (Balakrishnan & Fox, 1993). The discussion on the relations between the capital structure and the strategic based on market imperfection is explained by Kochhar (1996) using two approaches, namely agency theory, and transaction cost economics.

The agency theory is considered to have a strong influence on the management strategic research (Rumelt, Schendel. & Teece, 1991). This theory explains that the existence of uncertainty could raise up number of conflicts of interest among parties. The managers have incentives to pursue the strategies in order to reduce their employment risks (Amihud & Lev 1981), or to increase the firm size so that their compensation increase (Baker, Jensen & Murphy, 1988), even though the decision is not profitable for shareholders. To mitigate any possible conflicts, the attention should be directed on how to make the incentive system and to enable the management mechanism to minimize agency cost. The debt in this theory is viewed as a governance device which is useful to reduce the conflicts (Jensen, 1986). The debt would make managers have some obligations to pay the debt and its interest. If they spend free cash flow for a wasteful expenditure, it will cause disabilities of paying interest and debt, or in case of default, it may cause bankruptcy. Thus, the managers will lose their rights in taking decisions, even worse they will lose their employment if the firm is bankrupt.

Figure 1: Agency perspective on capital structure

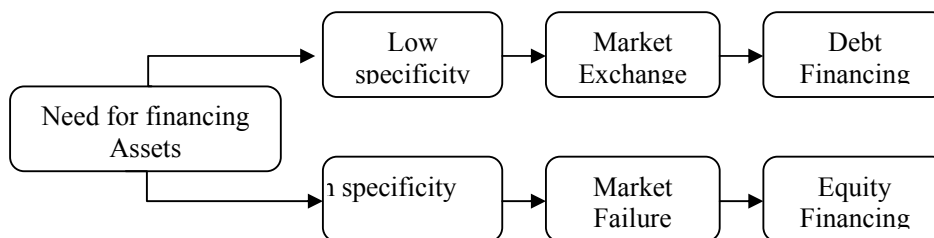


Sources: Kockhar (1996)

A hypothesis on the relations between the diversification and the capital structure is developed by applying the agency cost as depicted in figure 1. Given the high debt, responsibility to pay the debt's interest also arises. Therefore, the control of the debt relies upon the decrease of the free cash flow amount availability for the managers to invest in any wasteful things. In addition, given the supervision of debt holders, it could be difficult for the managers to justify the unrelated diversification strategy (Jensen, 1986, 1989). Thus, according to the agency cost theory, debt-equity ratio of a firm has a positive relation to the degree of relatedness among businesses, and the increase of debt to equity ratio of a firm is associated with the increase of the degree of relatedness among its business.

According to Kochhar (1996), transaction cost economics concerned with the governance of contractual relations between two parties to have a matched transaction leading to the economic cost exchange. In this approach, the financial structure decision is considered as the trade off between the benefit and the governance ability in which the trade off is determined by the specificity of assets as the following figure 2.

Figure 2: Transaction cost perspective on capital structure



Sources: Kockhar (1996)

According to the transaction cost of economics, Kochhar (1996) also develops a hypothesis on the relations between the product diversification strategy and

the capital structure. The product diversification is a response to unutilized resources. The difference between the related and the unrelated diversification is closely tied to the characteristics of the resources, however, in some theories it is argued that the degree of diversification is based on the level of the specification of assets. The more specific the assets, the more likely to lead to related diversification (Teece, 1982; Chatterjee, & Wernerfelt, 1991). The relations between specificity of the asset and the funding show that firms which apply the related diversification strategy prefer to use the equity financing to debt, while those of unrelated diversification tend to use financing through debt. Thus, according to transaction cost perspective, the hypothesis is developed stating that the debt-equity ratio of a firm is negatively related to the degree of the relatedness among its business, and a more debt-equity ratio of firm is associated with the decrease of related diversification degree.

Another approach called managerial (behavioral) perspective is proposed by Barton and Gordon (1988) explaining the relations between the capital structure and the diversification. This approach is based on the basic perspective strategy arguing that functional decision from which the financial decision is made by the managers who operate in a complex environment and is not solely determined by the external product market as implied by finance paradigm. The result of the research argues that managers in the firms having different diversification strategies have different reactions to their financial context when the capital structure is chosen. Not all managers use the rational choice and the firms' objectives to make a decision because they desire flexibility and freedom from the excessive restrictions of debt when possible. This result implies that not all managerial choices and multiple firm objectives represent economic rationality and be important to be included in the study of individual financial decisions, instead.

Despite the several literature on the theories about the relations between the capital structure and the product diversification, there are also some empirics studies about the relations of both variables with various evidence. Rumelt (1974) argues that leverage is one of the characteristics of a diversification group which is systemically and significantly different. The firms that apply single and related strategies tend to be conservative in terms of their financing (risk-averse), whereas the unrelated firms are less risk-averse. Barton and Gordon (1988) are more details in terms of their findings. They find that those who apply single strategy having capital structures tend to be higher than the related ones, followed straight by dominant strategy and unrelated diversification. Thus, the finding of Barton and Gordon (1988) support the existence of the agency theory in the relation between the capital structure and the diversification degree. The finding of Barton and Gordon (1988) also set the basis of the relation between contextual variables

of the firms and the capital structure which are also based on the categories of diversification strategy applied by the firms.

Some other results which are contrast to those previous findings are proposed by Riahi-Belkaoui and Banister (1994), Comment and Jarrel (1995), Chicker and Cosset (2001), Chen (2006), Lyandres (2007). They argue that the capital structure of the diversified firms are bigger than those of undiversified ones. In more details, Riahi-Belkaoui and Banister (1994) argue that diversified firms have more debt than those are undiversified. Meanwhile, Comment and Jarrel (1995) find that the average leverage ratio of firms is 33-34% based on their research sample, but it turns to be 38-40% of those having big business segment.

The relation between the diversification and the capital structure is also researched by Chicker and Cosset (2001) specified on multinational companies (MNC). In this research, the diversification is differed from international diversification and product diversification. By using the sample data of 219 taken from companies in 1992 until 1996, the research forms four regimes to identify the diversification by MNCs: 1) low international diversification and low product diversification, 2) low international diversification but high product diversification, 3) high international diversification but low product diversification, and the last 4) high international diversification and also high product diversification. Their conclusion is that the combination of those two applied diversifications proving the increase of the MNCs' leverage. Furthermore, by only using the product diversification, it can be seen that the leverage of the diversified companies is higher than those of undiversified ones. In line with the findings of Chicker and Cosset (2001), Chen (2006) also find empirical evidence that the leverage of multiple segment companies is higher than of a single segment companies. The sample data are taken from the companies listed in NYSE, AMEX, and NASDAQ in the period from January 1989 through December 1999.

Lyanders (2007) attempts to develop a model based on the theory of limited liability, which relates the capital structure to the product market decision. Based on the limited liability theory that contends that managers act as the representatives of shareholders so that would cause high leverage, it will cause the companies to act aggressively towards their product market. Lyanders apply the idea of the limited liability to analyze the behavior and value of conglomerate companies. An optimal capital structure is gained when there is a balance between the debt agency cost and the strategic advantage. This model is started by determining the optimal debt for the firm, and then followed by determining the best output strategy relying on the interaction within the industry, and later by measuring the firm's value. The developed model states that the competition interaction influenced the company operation strategy. The higher the level of competition interaction is, the higher the strategic benefit from the debt is. This situation causes debt equilibrium and

the leverage to become higher, as well. This conclusion interpreted by Lyanders (2007) is inconsistent with the conclusions of Brander and Lewis (1986) in terms of the quantity competition, of Showalter (1995) in terms of price competition, and of Schumacher (2001) in terms of price capacity competition.

Furthermore, Lyanders (2007) continues to develop his model to work for the conglomerate companies. Some propositions found are 1) conglomerate companies have lower value compared to single company, 2) optimal debt level which is the trade off of the debt agency cost and the strategic benefit is based on competition interaction level. Both propositions imply that conglomerate cannot operate optimally in every industry they are in because they have to consider the existence of any divisions in the companies that operate in other industries. The wider the distance is among the parameters of inter-industries interaction among conglomerate companies, the bigger the leverage deviation of each division is in those conglomerate companies from the optimal value in the industry. As the consequences, there are bigger possibilities of those conglomerate companies to lose their profit. This kind of position could cause more positive impact to single company. The empirical evidence presented by Lyanders argues that the increase of the interaction competition parameter would decrease the return of the conglomerates. Its supports the model explained previously.

Meanwhile mentioned above that empirical evidence is stated as one-way, in which diversification influenced the capital structure, Kockhar and Hitt (1998) find the reciprocal relation between capital structure (as part of the financial strategy) and diversification strategy. This research is conducted by using data of 187 manufacture companies listed in American Stock Exchange and New York Stock Exchange, which had applied the diversification strategy from 1982 until 1986. The first relation states that the financial decision is influenced by the applied diversification strategy. They divide the diversification into the related diversification (RD) and the unrelated diversification (UD). The result of the research shows that companies using RD are likely to use equity financing while the ones using UD are likely to use debt financing. This result supports the transactional cost rationale of the capital structure proposed by Kochhar (1996, 1997) and Balakrishnan and Fox (1993). The relation between both shows, the capital structure influences the type of diversification taken by those companies. This result is in line with another result of Chatterjee and Wernerfelt (1991) that says diversification is based on financing sources from within the companies.

In the Chinese stock market, Xizhen (2010) also finds that there is a reciprocal relation between the diversification strategy and the capital structure. He conducted the study using the data of 762 companies from 2003 until 2006. It is apparently in line with Yingchun (2011) undertaking a research on the relation between the diversification and the capital structure of 190 manufacture companies of Shanghai

stock exchange and Shenzhen Stock Exchange from 2001 until 2003. The result is there is a relation between capital structure and diversification strategy. However, he adds that it has to be seen further what sort of the relation is.

Among all empirical evidences presented previously, both that support the agency theory and the ones that supported the transaction cost of economics theory find that there is evidence which shows the irrelevance of the relation between the capital structure and the diversification (Singh, Davidson III and Suchard, 2003). This irrelevance could be found after undertaking a test on the hypothesis by using geographical diversification, asset turnover, firms' size, previous growth rate, expected growth and profitability.

RESEARCH METHOD

Sample Selections

We employ a panel data from 83 companies of 13 manufacturing industries that listed in IDX covering the period 2001–2010. The starting point is 2001 because we avoid the effect of 1999 economic crises in Indonesia. The selection companies are the companies that have complete data from 2001-2010. We further deleted firm-years with a very extreme value of its capital structure. Our sample contained 826 firm-years observation.

Category of Product Diversification (CPD)

In terms of the classification of product diversification, the simplest way is to divide the companies into two groups: the diversified firms (D) and undiversified or Single (S). Researchers that used both categories are Riahi-Belkoui & Bannister (1994), Comment and Jarrel (1995), Lyandres E. (2007). The more detailed category is undertaken by Kochhar and Hitt (1998) and Yingchum (2011). They divided the diversified companies into two: companies diversifying unrelated products called Unrelated Diversification (UD) and companies diversifying related products called Related Diversification (RD.) In regards to the studies of diversification of capital structure, as far as the researchers are concerned, no studies has ever taken more detailed diversification categories than the one proposed by Rumelt (1974) that used 9 categories.

This study combined the above three diversification categories, which are: Single, Related, and Unrelated Diversification. The reason not to use the more detailed classification is that there may not be enough data to obtain for each category given the limitations of the sample. In addition, the categorization can also be related to the measurement of diversification quantitatively which will be discussed in the next section.

For a single firm category, it can be described easily, that the firm does not produce products other than its main products. However the categorization of related and unrelated diversification of the firms gains a lot of debates, whether it is due to the activities related to key resources, or to the same market, or to the same technology or activities. If we use the categorization of the industrial sector by SIC, the debate will be whether the firm is included into those that undertake related diversification of companies using the 2-digit, or 3-digit, or 4-digit SIC code.

In this study we used JASICA of IDX to calculate the entropy of industry, therefore, to be consistent we use the JASICA to segmentize the business. Companies were categorized as related diversification if in the same sector, thus they were included into the first digit code of JASICA. As it is known, in JASICA there are nine sectors. The Reasons to use the 1-digit code of JASICA was the data used the published company data which were available in financial statements according to the standard IDX and the business segmentation of JASICA.

Degree of Relatedness of Diversification (DRD)

Up to present, researches on the diversification level of relatedness are calculated by using the Entropy of Jacquemin & Berry (1979). The Entropy developed by Jacquemin & Berry contains three elements of different operations: 1) the number of industries in which the company operates, 2) the distribution of the total inter-segment sales or assets of the industry, and 3) the level of relatedness among different industries.

This Entropy measurement is divided into two components: Entropy for UD and RD. In terms of measuring the entropy, as it is used in the previous types of diversification, the firms are considered to undertake related diversification if the firms are in the same sector of industrial classification according to JASICA. The size of distribution used is the level of sales of each segment.

Furthermore, to calculate the DRD of the firm's segment s of industry j that numbers of industries m are necessary to use the following formulas:

$$DRD = EUD + ERD \quad (a)$$

$$ERD = \sum_{j=1}^M P_j \sum_{s=j} P_{sj}^j \ln \left(\frac{1}{P_{sj}^j} \right) \quad (b)$$

$$EUD = \sum_{j=1}^M P_j \ln \left(\frac{1}{P_j} \right) \quad (c)$$

Notes:

- DRD_{tij} : Degree of Relatedness of Diversification of firm i in industry j in period t
- ERD : Entropy of Related Diversification
- EUD : Entropy of Unrelated Diversification
- P_j : The proportion of the segment's sales s that is not in the same industrial sector to the total sales of firm i
- P_{si}^j : The proportion of the segment's sales s that is in the same industry sector j to the total sales of firm i

Degree of Relatedness (DRD) measured by Jacquemin & Berry entropy has a value ranging from 0 to 2. DRD closer to 0 mean undiversified firm. If the value $0 < DRD < 2$, means diversified firm. DRD value closer to 2 indicating the firm operated in diversified industry.

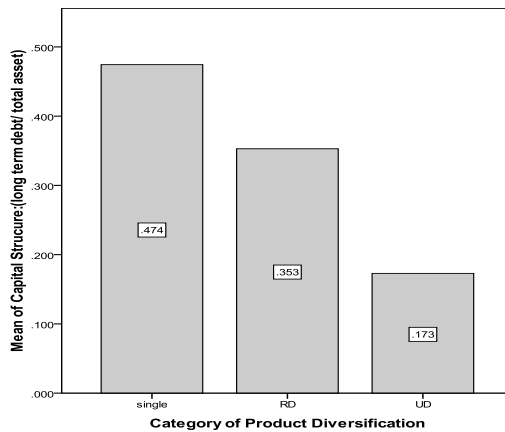
RESULTS AND DISCUSSION**The Influences of the Categorical of Product Diversification (CPD) on the Capital Structure**

There are two different theories emerging to predict the relationship of the product diversification with the capital structure, namely the theory of the agency and the transaction cost of economics. Both theories lead to different hypotheses. Based on the agency theory, categorical of product diversification has a negative effect on the capital structure of the company while the transaction cost economics theory says a diversified company depends on the level of the specific asset. The more specific the asset is, the more it is leading to related diversification. Thus, the categorical diversification of product will have a negative effect on the capital structure of the company.

Results of this study using regression analysis (see attachment 1) show a negative influence of the categorical product diversification on the capital structure. This finding supports the agency theory. This theory is based on the premise that the capital structure is a tool to manage and reduce conflict. Companies that have high debt will force managers to pay high-interest cost; thus managers have limitations to utilize free cash flow, especially for investments in areas not related to main business. Consequently, a firm with the undiversified product is a firm that has the highest capital structure.

The above regression result is more proven by using descriptive analysis of the capital structure for each category of the product diversification. Firms are divided into three groups: Single firm (S), Related Diversification (RD), and Unrelated Diversification (UD). We compared the average capital structure among those three categories. According to figure 3 the capital structure of the single firms is higher than the capital structure of the diversified firms. In the diversified firms, the RD firms have higher capital structure than the UD firms'. This finding supports the relation of the capital structure with the diversification which can be explained by the agency theory, and is congruent with Barton & Gordon (1988). A firm having high leverage has the responsibility to pay debt and interest. As the consequence, the amount of free cash flow available for the manager to invest for any wasteful things is decreasing. Therefore, as Jensen (1986, 1989) said, it makes managers feel difficult to justify an unrelated diversification strategy.

Figure 3: Mean of capital structure per category



The Influences of the Degree of Relatedness of Diversification (DRD) on the Capital Structure

The Degree of Relatedness (DRD) measured using the entropy of Jacquemin & Berry (1997) has a value of 0 to 2. When DRD is 0, it means that the companies do not diversify. If the company has a value of $0 < DRD < 2$, it means the company has been diversified. When the DRD close to 2, it means that the company is more diversified.

The regression result shows that the DRD has a negative influence on the capital structure. An explanation of this negative relationship is consistent with the agency theory. In the Agency viewpoint, debt reduces the agency costs and

prevents the managers from undertaking wasteful action. The agency cost is increasing when there is free cash flow available for the managers to be spent on wasteful expenditures. It also forces the managers to utilize assets efficiently to increase the firm's value. The negative influence of the DRD on the capital structure is also found from the analysis per industry. We found five out of thirteen industries showing the negative influences of the DRD on the capital structure while the rest do not have any significant case.

Figure 4: The mean capital structure per quartiles of DRD

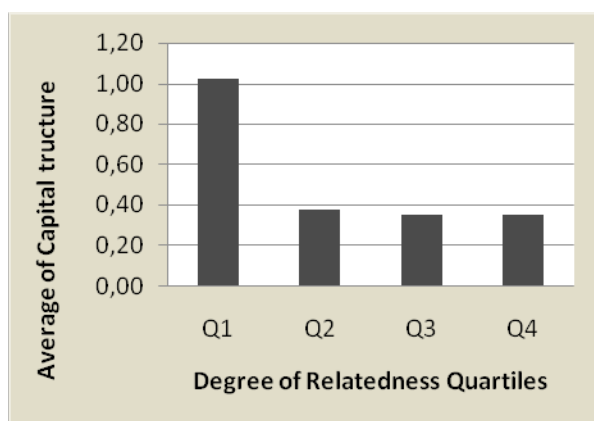


Figure 4 displays the mean capital structure per quartiles. Notwithstanding as obvious as negative relations, it is clear that differences exist between the cluster Q1 of DRD with three other clusters. The first cluster (Q1) has the highest capital structure than the others. This figure is consistent with the figure 3. The firms operating a single product (S) will have zero DRD value, and classified in the first cluster. In the categorical of product diversification, the S firms have the highest capital structure than the diversified firms either on the related diversification (RD) or the unrelated diversification (UD)

CONCLUSION

From the empirical findings, we found that there are the negative influences of product diversification on capital structure. The company which operates in a single business has the highest capital structure, followed by the related diversification firms and unrelated diversification firms. This paper empirically supports the agency theory. This theory is based on the premise that the capital structure is a tool to manage and reduce the conflict. Companies that have high debt will force managers to pay high interest cost; thus managers have limitations

to utilize free cash flow, especially for investments in areas which are not related to main business. Consequently, a firm with undiversified product is the one that has the highest capital structure.

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ATTACHMENT

<i>Model Summary</i>				
<i>Model</i>	<i>R</i>	<i>R Square</i>	<i>Adjusted R Square</i>	<i>Std. Error of the Estimate</i>
1	.246 ^a	.061	.058	.404595

a. Predictors: (Constant), DRD, CPD

<i>ANOVA^b</i>						
<i>Model</i>		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	8.704	2	4.352	26.585	.000 ^a
	Residual	134.723	823	.164		
	Total	143.426	825			

a. Predictors: (Constant), DRD, CPD

b. Dependent Variable: CS

<i>Coefficients^a</i>						
<i>Model</i>		<i>Unstandardized Coefficients</i>		<i>Standardized Coefficients</i>	<i>t</i>	<i>Sig.</i>
		<i>B</i>	<i>Std. Error</i>	<i>Beta</i>		
1	(Constant)	.592	.039		15.001	.000
	CPD	-.105	.028	-.175	-3.795	.000
	DRD	-.113	.057	-.092	-1.987	.047

a. Dependent Variable: CS