

**ANALYZING THE U.S CREDIT DEFAULT SWAP (CDS) MARKETS:
EFFICIENCY, INTERDEPENDENCE, CONTAGION, CAUSAL FLOWS
AND ASYMMETRIC DETERMINANTS**

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**Thesis Submitted in Fulfillment of the Requirements for the Degree of
Doctor of Philosophy in the School of Maritime Business and Management
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DEDICATION

To my dad, you were my inspiration and I love you for making me a good person.

To my mother and family, you are my universe. To my lovely wife, we will accomplish the dreams together.

Abstract of the thesis presented to the Senate of Universiti Malaysia
Terengganu in the fulfillment of the requirement for degree of
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School : School of Maritime Business and Management

The Credit Default Swap (CDS) with its unique characteristic to transfer credit risk has gained considerable attention especially after the financial crises of 2007-08. Extant literature has given less focus to CDS and the pivotal research areas such as efficiency, interdependence, contagion, causal-flows between credit and stock markets and determinants of credit markets are relatively untapped.

In view of the above limitation, this thesis first examines the relative efficiency (power law properties) of the United States of America (U.S) CDS and equity sectors and the mutual interdependence between CDS-equity market pairs. CDS markets are relatively more inefficient as compared to their equity counterparts. The empirical analysis reveals that Basic Materials (Utilities) industry credit market has the highest (lowest) interdependence with other industries. The contagion effects between U.S industry-level credit markets mainly occurred during the global financial crisis of 2007-08.

The Wavelet Squared Coherence (WTC) estimation results show that credit and stock markets are out of phase (counter cyclical) and stock markets lead their credit counterparts. The Banks (Utilities) industry credit and stock markets have relatively high (low) dependence. The causal links are then analyzed through bootstrap rolling window estimations. Bidirectional causalities are found between the credit and stock markets that vary over different sub-samples. Overall business conditions, stock market volatility (VIX), default premia, Treasury bond rate and slope of the yield curve are the major drivers of the CDS-stock nexuses.

Finally, the presence of nonlinearities in the short- and long-run relationships between U.S. industry-wise CDS index spreads and a set of macroeconomic and financial variables, namely industry stock indices, the VIX index, 5-year Treasury bond yields and the crude oil price, is examined using the Nonlinear Autoregressive Distributed Lags (NARDL) approach. The empirical results provide significant evidence of both short- and long-run asymmetries in the linkage between industry CDS spreads and the potential driving factors considered for all industries, confirming the importance of nonlinearity in this context.

The findings provide possible explanation to varying and mixed previous empirical findings in the existing literature, and hence have useful investment implications. The findings of this thesis have relevant implications for investors, speculators, arbitrageurs and policy makers.

Abstrak tesis yang dikemukakan kepada Senat Universiti Malaysia Terengganu sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**ANALISA PASARAN SWAP MUNGKIR KREDIT (CDS) A.S.:
KECEKAPAN, KESALINGBERGANTUNGAN, PENULARAN, ALIRAN
KAUSAL DAN PENENTU ASIMETRIK**

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Swap Mungkir Kredit (CDS) memiliki ciri-ciri yang unik untuk memindahkan risiko kredit dan telah mendapat perhatian yang lebih mendalam selepas krisis kewangan 2007-08. Namun begitu, literatur sedia ada kurang memberi tumpuan kepada CDS, manakala bidang penyelidikan yang penting seperti kecekapan, kesalingbergantungan, penularan, aliran kausal di antara pasaran kredit dan saham serta penentu pasaran kredit masih kurang diterokai.

Berikutan batasan kajian di atas, tesis ini dimulakan dengan mengkaji kecekapan relatif (*power law properties*) bagi CDS Amerika Syarikat (AS) dan sektor ekuiti serta kesalingbergantungan bersama bagi pasangan pasaran CDS-ekuiti. Pasaran CDS didapati agak kurang cekap berbanding pasaran ekuiti. Selain itu, kajian empirikal menunjukkan bahawa pasaran kredit industri Bahan Asas (Utiliti) mempunyai kesalingbergantungan tertinggi (terendah) dengan industri-industri lain. Kesan penularan di antara pasaran kredit industri di peringkat AS berlaku terutamanya semasa krisis kewangan global 2007-08.

Anggaran daripada *Wavelet Squared Coherence* (WTC) menunjukkan bahawa pasaran kredit dan saham berada di luar fasa (kitaran berbalas) dan pasaran saham mendahului pasaran kredit. Industri kredit dan pasaran saham bagi Perbankan (Utiliti) pula mempunyai kebergantungan yang tinggi (rendah). Di samping itu, analisa menggunakan anggaran *bootstrap rolling window* menunjukkan kausaliti dwiarah di antara pasaran kredit dan saham yang berubah mengikut sub-sampel berbeza. Manakala keadaan keseluruhan perniagaan, turun naik pasaran saham (VIX), premia mungkir, kadar bon Perbendaharaan dan cerun keluk hasil merupakan pemacu utama terhadap neksus CDS-saham.

Akhir sekali, pendekatan *Nonlinear Autoregressive Distributed Lags* (NARDL) telah digunakan untuk memeriksa kewujudan ketidaklinearan di dalam hubungan jangka pendek dan jangka panjang di antara jurang indeks CDS industri AS dan satu set pembolehubah makroekonomi dan kewangan. Set pembolehubah tersebut meliputi indeks saham industri, indeks VIX, hasil 5 tahun bon Perbendaharaan dan harga minyak mentah. Hasil kajian menunjukkan asimetri jangka pendek dan panjang yang signifikan di antara jurang industri CDS dan faktor-faktor yang dipertimbangkan untuk semua industri. Dapatan ini mengesahkan kepentingan ketidaklinearan di dalam konteks tersebut.

Penemuan kajian tesis ini memberikan penjelasan terhadap dapatan empirikal yang berbeza di dalam literatur sedia ada, seterusnya mempunyai implikasi yang berguna terhadap pelaburan. Hasil daripada tesis ini juga mempunyai kesan yang penting untuk pelabur, spekulator, pengorbitraj dan penggubal dasar.