

ANALYSIS

February 2019

Prepared by

Mark Zandi
Mark.Zandi@moodys.com
Chief Economist

Sophia Koropecyj
Sophia.Koropecyj@moodys.com
Managing Director

Contact Us

Email
help@economy.com

U.S./Canada
+1.866.275.3266

EMEA
+44.20.7772.5454 (London)
+420.224.222.929 (Prague)

Asia/Pacific
+852.3551.3077

All Others
+1.610.235.5299

Web
www.economy.com
www.moodysanalytics.com

Universal Child Care and Early Learning Act: Helping Families and the Economy

Introduction

American households are struggling to find high-quality, affordable child care for their young children. This is a serious financial burden to these families, and it is also weighing on the economy, because it crimps the ability of parents to work. Labor force participation of prime-age workers has at best been stuck in place for more than three decades, limiting the growth in the labor force and broader economy, particularly as the large baby boomer cohort retires. The Universal Child Care and Early Learning Act would go a significant way toward addressing the financial plight of these families and supporting economic growth.

Universal Child Care and Early Learning Act: Helping Families and the Economy

BY MARK ZANDI AND SOPHIA KOROPECKY

American households are struggling to find high-quality, affordable child care for their young children. This is a serious financial burden to these families, and it is also weighing on the economy, because it crimps the ability of parents to work. Labor force participation of prime-age workers has at best been stuck in place for more than three decades, limiting the growth in the labor force and broader economy, particularly as the large baby boomer cohort retires. The Universal Child Care and Early Learning Act would go a significant way toward addressing the financial plight of these families and supporting economic growth.

Need for child care

Families are in desperate need of high-quality, affordable child care. Fifty years ago, approximately half of all women stayed home to take care of their children. As female participation in the workforce increased rapidly in the 1970s and 1980s, stay-at-home moms became much less common. Today, only about one-fourth of moms are at home with their kids.

Spending on child care has risen commensurately. Some 4.9 million American households spent almost \$36 billion on day care centers, nurseries and preschools in 2017.¹ The typical household that has child-care expenses spent \$7,200 per year, equal to approximately 10% of their income.² Given this significant expense, only about one-third of families with the nearly 20 million kids under the age of 5 use child-care services; the rest rely on relatives or informal and often unreliable arrangements.

The cost of child care varies considerably across the country. Nationwide, the average cost of putting a child younger than 5 into full-time formal care was close to \$10,000 in 2017. But costs range as high as more than \$20,000 a year for center-based infant care

in Massachusetts and Washington DC, to closer to \$5,000 a year for family-based child care for a 4-year-old in Alabama and Texas.³

The cost of child care has also risen quickly, substantially outpacing overall inflation. Over the past 20 years, the cost of day care has doubled, while prices for all goods and services are up only about 1½ times (see Chart 1). Although day care costs have risen more slowly more recently, this is unlikely to last, since the tight labor market is quickly driving up wages for day care workers, the biggest cost of supplying day care services.

The high and quickly rising cost of child care has weighed heavily on female labor force participation. Indeed, participation by women in their 20s, 30s and early 40s peaked in the late 1990s.

Existing government support

There is a patchwork of government programs to help families get child care and prekindergarten educational services. At the federal level, the biggest programs include [Head Start](#) and the [Child Care and Development Block Grant](#). These programs are effective, but are targeted to help only low-income families, typically those who earn

less than 85% of a state's median income, and reach only a small percentage of eligible low-income families. The U.S. military also heavily subsidizes child-care centers for a couple of hundred thousand service members. Together, these programs reach about 2.5 million children under the age of 5 at a cost of approximately \$10 billion per annum.

Middle-class families also benefit from federal child-care tax credits, but the support is modest and not nearly enough to cover their child-care costs. Moreover, the tax credits are not refundable, so the benefit does not help working-class families who do not have a tax liability. These tax credits are used by about 6.5 million taxpayers at a cost of close to \$6 billion per annum.

And at the state and local level, 43 states and the District of Columbia provide prekindergarten programs that serve about 1.5 million 3- and 4-year-old children.

Universal Child Care and Early Learning Act

Senator Elizabeth Warren has proposed the Universal Child Care and Early Learning Act to address families' need for high-quality, affordable child care. The proposal estab-

lishes a federal government program, administered by state and local governments, nonprofit providers, tribal organizations, and other community entities, that guarantees families access to care for their children from birth to when they enter school. Access to high-quality, affordable child care would become an entitlement.

The program establishes a network of public child-care centers and family child-care homes, staffed by child-care workers who will receive wages competitive with public school teachers in their communities. It builds on current federal child-care programs, most notably the military child-care program and the federal Head Start program, which offers children a full range of educational, health, social and other services. This proposal significantly scales up Head Start, utilizing its existing centers and providers, allowing them to continue serving low-income children while also enrolling children who are not from low-income families.

The current Child Care and Development Block Grant Program would become a supplemental support for low-income families who require additional services in the private child-care market for needs that may not be fully covered by the new system, including extended hours, some specialized services for children with disabilities, and after-school services for children 5 to 13 years old.

Under this proposal, all families will be able to access child-care and early learning services regardless of their income, employment or circumstance. Families below 200% of the federal poverty line could access these services at no cost. Middle-class families above this threshold would pay a subsidized fee based on their income. No family would pay more than 7% of their income for these child-care services.⁴

The Universal Child Care and Early Learning Act would substantially increase the number of children able to receive formal child care. An estimated 6.8 million children, equal to about one-third of those younger than age 5, receive formal care today. The proposal would ensure an estimated 12 million children, equal to 60% of those younger than 5, will ultimately receive formal care. Parents or other relatives will care for 30% of

kids, about the same percentage as today, while only 10% of kids will have no regular arrangement for child care, down from just less than one-third of kids today. Of those receiving formal care, 8.8 million kids in families below 200% of the federal poverty line would receive free child care. The typical American family with young children currently paying for formal care would see their annual child-care costs decline by 17% to less than \$6,000 per year.

Budgetary costs

The additional cost to the federal government of providing universal child care under this proposal is estimated to be approximately \$70 billion per annum on average, or \$700 billion over a 10-year budget horizon on a dynamic basis (after accounting for the economic impacts of the proposal).

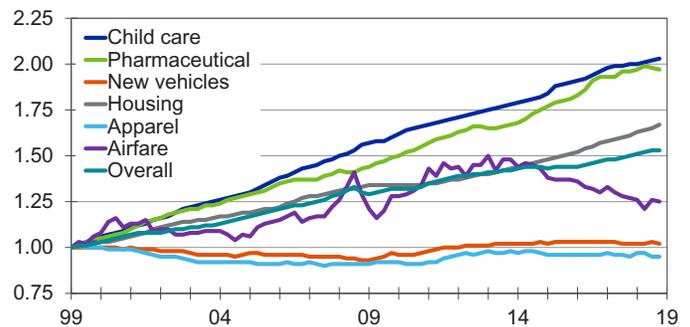
This is based on a number of assumptions, including that the proposal becomes law this year and becomes effective in calendar year 2020 (see Table 1). We also assume that it takes two years before there is full take-up on the program. It will take time for the centers and family child-care homes to become fully operational across the country and for families to work out what options are best for them.

The budget cost estimates also depend on the assumption that almost two-thirds of families that use formal child care will use center care, which is more expensive than family child-care homes. We assume that the cost of center care by 2020 will be \$14,500 per child, compared with almost \$11,000 per child for family child-care homes. These costs also reflect the proposal's mandate to pay child-care workers substantially more than they earn currently to ensure consistently higher quality of care.⁵

To help defray some of the federal government's costs, for low-income children the

Chart 1: Child Care Costs Surge

Consumer prices, 1999Q1=1



Sources: BLS, Moody's Analytics

local administrator will cover 20% of the cost and the federal government the remaining 80%. For children in families with higher incomes, 50% of the cost of care will be covered by the local administrator through the collection of parental co-payments and other means, and the federal government will pick up the remaining half. Regardless of the arrangement between the federal government and the local administrator, no family will be required to spend more than 7% of their income on public child care.

The proposed universal child care and early learning services could be paid for by revenues generated by Warren's proposed 2% tax on household net worth above \$50 million and 3% tax on net worth above \$1 billion. That is, \$700 billion out of the total 10-year revenues generated by the proposed net worth tax could be used to pay for the child-care proposal.⁶ The Universal Child Care and Early Learning Act is thus deficit neutral over the 10-year budget horizon on a dynamic basis.

Economic lift

To determine the impact of the proposal on the broader economy, we use the Moody's Analytics model of the U.S. economy.⁷ The proposal quickly lifts economic growth, as the stimulus created by providing financial support to lower-income and middle-class families more than offsets the negative fallout from increasing taxes on the very wealthy. Low- and middle-income households have a much larger marginal propensity to spend—the share of their income they spend—than do the wealthy.

Table 1: Impact of Universal Child Care and Early Learning Act

	Children younger than 5 yrs old (mil)		Total cost of formal child care (\$ bil)	Federal government cost of formal child care (\$ bil)			Additional GDP due to Act (\$ bil)
	Total	With formal child care		Static budget cost	Dynamic budget cost	Additional dynamic cost	
2019	19.81	6.79	na	na	na	na	na
2020	19.76	6.92	78.7	54.2	47.6	34.5	21.3
2021	19.77	9.89	134.3	86.4	75.6	62.2	34.9
2022	19.84	11.91	166.0	104.9	91.0	77.3	45.2
2023	19.91	11.95	171.3	108.3	92.3	78.3	51.7
2024	19.97	11.98	177.0	111.9	93.3	78.9	60.1
2025	20.00	12.00	183.2	115.8	94.1	79.4	70.1
2026	20.03	12.02	190.0	120.1	94.7	79.6	82.2
2027	20.04	12.02	197.8	125.0	95.0	79.5	96.9
2028	20.05	12.03	206.4	119.4	85.4	69.4	110.1
2029	20.04	12.02	215.3	124.5	84.3	68.0	130.0
2020-2029			1,719.8	1,070.4	853.4	707.2	702.4

Notes:

Static budget cost is the cost to the federal govt. of providing formal child care without accounting for the economic impact on the budget.

Dynamic budget cost is the cost to the federal govt. of providing formal care after accounting for the economic impact on the budget.

Additional dynamic budget cost is the dynamic budget cost excluding current federal govt. spending on formal child care.

Sources: Census Bureau, BEA, Moody's Analytics

Further boosting near-term growth will be the significant expansion of child-care centers across the country. Existing child-care centers employ 1.5 million workers, which will increase substantially under the proposal as the number of children receiving child care expands. The significantly higher wages paid to child-care workers will also increase their spending, adding to the economic benefit.

Longer run, the economy gets a boost from the proposal as lower child-care costs lift labor force participation and hours worked.⁸ It becomes cost effective for more parents to work, and the extra time and scheduling flexibility created by the child care allows them to work more hours. Research on the labor supply impact of lower child-care costs shows there are meaningful impacts, and our own research is consistent with this.⁹ Accessible child care facilitated by federal support to child-care providers has especially strong employment effects for

single mothers, moms with young children, and lower-income mothers.¹⁰

There is little impact on the economy from the higher taxes on wealthy households. These households have substantial financial resources and will not significantly change their spending and saving behavior. Moreover, since the increase in tax revenues pays for the expansion of child-care services, it ensures that the Universal Child Care and Early Learning Act would be deficit neutral, with no resulting material impact on interest rates.

These results likely understate the economic benefits of the proposal. The model does not consider that the increased support for early childhood education should also ultimately reap economic benefits. According to the best known study on the issue, the benefits, including greater lifetime earnings, the non-earnings benefits of reduced transfer payments and remedial education expenditures, and savings from less demand on the

criminal justice system, are substantial.¹¹

Studies conducted on a variety of other pre-school programs find similarly large increases in earnings and societal benefits.¹²

Conclusions

The cost of high-quality child care is a heavy burden on the finances of American families and the economy. In many parts of the country, high-quality child care is not even available. The Universal Child Care and Early Learning Act addresses this serious problem. It is fiscally responsible proposal that would scale up federal child-care programs that are already in place and shown to be effective in meeting the challenges of providing high-quality child care. The proposal significantly reduces the cost burden of child care for most families, improves the quality of child care, enhances childhood development, and supports increased labor force participation and stronger economic growth.

Endnotes

- 1 This is based on data from the Bureau of Labor Statistics' 2017 [Consumer Expenditure Survey](#).
- 2 Households in the top decile of the income distribution, with annual income of over \$155,000, spend almost \$12,000 per annum on child care, while those in the bottom decile, making less than \$13,000 per annum, spend close to \$3,600.
- 3 These costs are determined by a January 2018 survey conducted by [ChildCare Aware](#) of Child Care Resource and Referral agencies. Respondents were asked to provide 2017 cost data for infants, toddlers, 4-year-old children, and school-age children in legally operating child-care centers and family child-care homes. Legally operating programs include licensed programs and child-care programs that are legally exempt from licensing.
- 4 The U.S. Department of Health and Human Services considers [child-care costs above 7% of a family's income](#) unaffordable. The national average cost of center-based child care was \$10,132 in 2017, according to ChildCare Aware, or 17% of median household income.
- 5 The mean hourly wage of a child-care worker in 2017 was \$10.67, 44% of the mean hourly wage across all occupations. State qualifications for child-care workers vary across states, ranging from no required training to a college degree. Further, four-fifths of states establish different requirements depending on whether a program is home-based, center-based or public preschool. Even in states that require that caregivers hold a college degree, their earnings fall well below that of teachers of older children.
- 6 An [estimate of the tax revenue](#) generated by Warren's net worth tax is provided by University of California, Berkeley economists Emmanuel Saez and Gabriel Zucman.
- 7 One complication is that we have not evaluated the budget or economic implications of the senator's wealth tax. As such, we instead assume that her child-care program is paid for by reforms to the estate tax sufficient to generate the needed tax revenue. We have previously modeled the impact of estate taxes, as this is an oft-proposed change in the tax code and was used by the senator to pay for her recently proposed proposal to address the affordable housing crisis. The working assumption is that the budget and economic impacts of higher estate taxes are similar to those of her wealth tax. See "[Addressing the Affordable Housing Crisis](#)," Mark Zandi, Moody's Analytics white paper, September 2018 for an analysis of the economic impact of Senator Warren's Housing and Economic Mobility Act.
- 8 The personal financial costs to parents who leave the workforce to care for a young child because of the high cost of child care are high. They accumulate fewer skills, and their productivity is diminished, resulting in lower wages when the parent eventually returns to the workforce. The effect tends to fade only after several decades. Further, a woman's career progression is reduced even more if she has more than three children, and the penalty to wages is never made up. Even when women remain engaged through part-time work, their career progress is reduced.
- 9 For more information on the labor force participation rate impacts, a literature review is available in L. J. Bettendorf, E. L. Jongen, and P. Muller, [Child Care Subsidies and Labour Supply—Evidence From a Large Dutch Reform](#), Labour Economics (2015).
- 10 Kimberly Burgess, Nina Chien, Maria Enchautegui, "[The Effects of Child Care Subsidies on Maternal Labor Force Participation in the United States](#)," Department of Health and Human Services, ASPE Issue Brief, 1-6 (2016).
- 11 James J. Heckman, Seong Hyeok Moon, Rodrigo Pinto, Peter A. Savellyev, and Adam Yavitz, [The Rate of Return to the High/Scope Perry Preschool Program](#), *Journal of Public Economics* Vol. 94.1 (2010): 114-128.
- 12 Leonard N. Masse and W. Steven Barnett, [Comparative Benefit-Cost Analysis of the Abecedarian Program and Its Policy Implications](#), *Economics of Education Review* Vol. 26.1 (2007): 113-125. Arthur J. Reynolds, Judy A. Temple, Suh-Ruu Ou, Irma A. Arteaga, and Barry A.B. White. 2011, [School-Based Early Childhood Education and Age-28 Well-Being: Effects by Timing, Dosage, and Subgroups](#) *Science* Vol. 333.6040 (2011): 360-364.

About the Authors

Mark Zandi is chief economist of Moody's Analytics, where he directs economic research. Moody's Analytics, a subsidiary of Moody's Corp., is a leading provider of economic research, data and analytical tools. Dr. Zandi is a cofounder of Economy.com, which Moody's purchased in 2005.

Dr. Zandi is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and is the lead director of Reinvestment Fund, one of the nation's largest community development financial institutions, which makes investments in underserved communities.

He is a trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public. Dr. Zandi frequently testifies before Congress and conducts regular briefings on the economy for corporate boards, trade associations, and policymakers at all levels. He is often quoted in national and global publications and interviewed by major news media outlets, and is a frequent guest on CNBC, NPR, *Meet the Press*, CNN, and various other national networks and news programs.

Dr. Zandi is the author of *Paying the Price: Ending the Great Recession and Beginning a New American Century*, which provides an assessment of the monetary and fiscal policy response to the Great Recession. His other book, *Financial Shock: A 360° Look at the Subprime Mortgage Implosion, and How to Avoid the Next Financial Crisis*, is described by the New York Times as the "clearest guide" to the financial crisis.

Dr. Zandi earned his BS from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania.

Sophia Koropecyk is a managing director for Moody's Analytics. Sophia co-manages the Research department in West Chester PA, oversees the firm's publications and consulting projects, edits many of the publications, trains new staff members, and gives presentations to clients and trade groups. She also forecasts and writes about trends in the U.S. labor market, has worked on many labor-related consulting projects, and is often interviewed by the media about labor market conditions. Sophia has been with Moody's Analytics since 1994. Previously, she worked as an economist for the Great Lakes Trade Adjustment Assistance Center and WEFA (now IHS Global Insight). Sophia pursued her doctoral studies in economics at the University of Michigan. She earned a master's degree in finance at Drexel University and a bachelor's degree in economics and history at the University of Pennsylvania.

About Moody's Analytics

Moody's Analytics provides financial intelligence and analytical tools supporting our clients' growth, efficiency and risk management objectives. The combination of our unparalleled expertise in risk, expansive information resources, and innovative application of technology helps today's business leaders confidently navigate an evolving marketplace. We are recognized for our industry-leading solutions, comprising research, data, software and professional services, assembled to deliver a seamless customer experience. Thousands of organizations worldwide have made us their trusted partner because of our uncompromising commitment to quality, client service, and integrity.

Concise and timely economic research by Moody's Analytics supports firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our economic research publications provide in-depth analysis of the global economy, including the U.S. and all of its state and metropolitan areas, all European countries and their subnational areas, Asia, and the Americas. We track and forecast economic growth and cover specialized topics such as labor markets, housing, consumer spending and credit, output and income, mortgage activity, demographics, central bank behavior, and prices. We also provide real-time monitoring of macroeconomic indicators and analysis on timely topics such as monetary policy and sovereign risk. Our clients include multinational corporations, governments at all levels, central banks, financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

Moody's Analytics added the economic forecasting firm Economy.com to its portfolio in 2005. This unit is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at www.economy.com.

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). Further information is available at www.moodyanalytics.com.

DISCLAIMER: Moody's Analytics, a unit of Moody's Corporation, provides economic analysis, credit risk data and insight, as well as risk management solutions. Research authored by Moody's Analytics does not reflect the opinions of Moody's Investors Service, the credit rating agency. To avoid confusion, please use the full company name "Moody's Analytics", when citing views from Moody's Analytics.

About Moody's Corporation

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). MCO reported revenue of \$4.2 billion in 2017, employs approximately 11,900 people worldwide and maintains a presence in 41 countries. Further information about Moody's Analytics is available at www.moodyanalytics.com.

© 2019 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S INVESTORS SERVICE, INC. AND ITS RATINGS AFFILIATES ("MIS") ARE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MOODY'S PUBLICATIONS MAY INCLUDE MOODY'S CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL, FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS AND MOODY'S OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. CREDIT RATINGS AND MOODY'S PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. NEITHER CREDIT RATINGS NOR MOODY'S PUBLICATIONS COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS AND PUBLISHES MOODY'S PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS AND MOODY'S PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS OR MOODY'S PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing the Moody's publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY SUCH RATING OR OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any rating, agreed to pay to Moody's Investors Service, Inc. for appraisal and rating services rendered by it fees ranging from \$1,500 to approximately \$2,500,000. MCO and MIS also maintain policies and procedures to address the independence of MIS's ratings and rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold ratings from MIS and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at www.moody's.com under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors. It would be reckless and inappropriate for retail investors to use MOODY'S credit ratings or publications when making an investment decision. If in doubt you should contact your financial or other professional adviser.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any rating, agreed to pay to MJKK or MSFJ (as applicable) for appraisal and rating services rendered by it fees ranging from JPY200,000 to approximately JPY350,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.