Universidade de Brasília
Departamento de Economia
Pós-Graduação em Economia

Plano de Ensino

Dados de Identificação	
Disciplina:	Tópicos Especiais em Análise Econômica (Macro Quantitativa)
Período	2º / 2021
Professor:	Tomás R. Martinez
	tomas.martinez@unb.br
	https://tomasrm.github.io/
Horário e local:	Terça e Quinta às 16:00-18:00
Carga Horária	60 horas (4 créditos)

1 Objetivos e Descrição do Curso

O curso tem dois objetivos principais: (i) familiarizar o estudante com a pesquisa de fronteira na macroeconomia com agentes heterogêneos, e (ii) proporcionar as ferramentas necessárias para solucionar esses modelos computacionalmente.

O curso será dividido em dois grandes "módulos". No primeiro, estudaremos heterogeneidade no nível da família. Utilizaremos modelos com mercados incompletos onde a distribuição de riqueza da economia é endógena, e choques econômicos individuais (renda, emprego, saúde) tem fortes implicações para o consumo das famílias/agentes. Políticas públicas como tributação, seguro desemprego, e previdência terão impactos de primeira ordem no bem-estar das famílias.

No segundo, estudaremos heterogeneidade no nível da firma. Utilizaremos modelos de *firm/industry dynamics* e de empreendedorismo (*occupational choice*) para estudar as decisões de emprego, investimento, inovação, entrada de mercado, etc, e suas implicações macroeconômicas.

Finalmente, discutiremos como levar esses modelos aos dados (em particular, no uso de métodos de inferência causal em macro), e em caso que haja demanda, métodos computacionais de solução em tempo contínuo e modelos HANK (*Heterogeneous Agent New Keynesian*). O conteúdo do curso é adaptável, e podemos dedicar mais ou menos tempo a um assunto dependendo do interesse dos estudantes matriculados.

2 Metodologia e Avaliação

A dinâmica do curso será a seguinte: o professor apresentará os modelos e os métodos computacionais para solucioná-los. Os estudantes entregarão listas de exercícios (4 ou 5) onde irão resolver os modelos básicos no computador (em uma linguagem de programação da sua escolha), farão uma apresentação de um artigo a escolha, e ao final do curso entregarão um projeto de pesquisa.[1]

1. Lista de Exercícios (em grupo) (50%)
2. Apresentação (individual) (20%)

[1] Exemplos de possíveis artigos para apresentação na parte de "outras aplicações" do conteúdo programático. O estudante também pode sugerir um artigo que pode ou não ser aceito pelo professor.

3. Proposta de Pesquisa (individual ou em dupla) (30%)

O requisito mínimo para seguir o curso é ter feito um curso inicial de Macroeconomia ao nível da pós-graduação e ter noções de programação dinâmica. Como o curso requer apresentações de estudantes e do professor, a presença durante a aula será exigida e seguirá as normas da universidade.

3 Material

O curso será baseado em artigos (as leituras obrigatórias estão marcadas com *). Alguns livros podem ser úteis para determinados tópicos em métodos computacionais.

- **Ljungqvist, Lars and Thomas J. Sargent. 2004.** ***Recursive Macroeconomic Theory***: Referência básica para programação dinâmica. Tem um capítulo dedicado para o modelo de Huggett-Aiyagari.
- **Sargent, Thomas and John Stachurski. 2021.** ***QuantEcon***: Introdução open source para aprender a programar em Python e em Julia. https://quantecon.org/
- **Heer, Burkhard and Alfred Maussner. 2008.** ***Dynamic General Equilibrium Modeling***: Ótima referência para métodos aplicados a modelos de agentes heterogêneos.
- **Fehr, Hans and Fabian Kindermann. 2018.** ***Introduction to Computational Economics using Fortran***: Para os que querem se aventurar em Fortran. Útil mesmo se você programa em outra linguagem, já que os algoritmos são claros e bem explicados.

Outros livros podem ser úteis em outras aplicações: Judd (1998) é a enciclopédia básica de economia computacional. Canova (2007) é ótimo para DSGE e séries temporais. Miranda and Fackler (2002) é uma boa referência com Matlab.

4 Conteúdo Programático

1. **Heterogeneidade na Família**
   (a) Desigualdade de renda e de riqueza: O modelo de Bewley-Huggett-Aiyagari-Imrohoroglu. Aiyagari (1994)*, Guvenen (2011)*, Heathcote et al. (2009).
   (b) Desigualdade de Consumo, Renda e Riqueza durante o ciclo de vida. Storesletten et al. (2004)*, Huggett et al. (2011), Kaplan and Violante (2010).
   (c) Além do *Stationary Equilibrium*: Dinâmicas de transição e choques agregados. Krusell and Smith (1998)*, Boppart et al. (2018)*, Krueger et al. (2016), Algan et al. (2014).
   (d) Métodos Computacionais: Endogenous Grid Method; Discretização do processo estocástico (Tauchen & Rowenhorst); Non-stochastic simulation of the Stationary Distribution; Algoritmo de Krussel & Smith; Método de Reiter.
   (e) **Outras Aplicações**: Consumption and Income Inequality (Krueger and Perri, 2006); Long Run Trends in Hours and Income Inequality (Heathcote et al., 2010); Social Security (Conesa and Krueger (1999), Fuster et al. (2007)); Labor and Capital Taxation (Conesa et al. (2009),Guvenen et al. (2014);); Wealth Inequality (De Nardi and Fella (2017), Quadrini (2000)) Fiscal Policy and the Wealthy hand-to-Mouth (Kaplan and Violante, 2014); Human Capital and Education (Lochner and Monge-naranjo (2011), Abbott et al. (2019)); Family Economics (Greenwood et al.

(2016), Barczyk and Kredler (2018), Voena (2015)); Progressive Taxation (Heathcote et al. (2020), Boar and Virgilu Midrigan (2020)); Risk and Income Dynamics (De Nardi et al., 2020); Consumer Default (Chatterjee et al. (2007), Livshits et al. (2007); Welfare/ Cash Transfer Policy (Low et al. (2010), Wellschmied (2021)); Volatility Shocks and Consumption over the Business Cycles (Bayer et al. (2019), McKay (2017)); Labor Market Frictions (Krusell et al. (2010), Bils et al. (2011), Nakajima (2012));

2. **Heterogeneidade na Firma.**

   (a) Heterogeneidade na produtividade e *firm dynamics*. Hopenhayn (2014)*, Hopenhayn and Rogerson (1993)*, Hopenhayn (1992).

   (b) Comércio Internacional. (Melitz, 2003).

   (c) *Misallocation*. Restuccia and Rogerson (2017)*, Restuccia and Rogerson (2008)*, Hsieh and Klenow (2009).

   (d) Empreendedorismo, frições financeiras e desenvolvimento. Buera et al. (2011)*, Midrigan and Xu (2014).

   (e) Choques, Custo de Ajuste e Flutuações Agregadas. Clementi and Palazzo (2016)*, Khan and Thomas (2008), Bachmann and Bayer (2013).

   (f) Métodos Computacionais: Projection Methods; Discrete Choice; Terry (2017), Winberry (2018).

   (g) **Outras Aplicações**: Innovation and Quality Ladders (Klette and Kortum (2004), Akcigit and Kerr (2018)); Uncertainty Shocks (Bloom et al. (2018), Bloom (2009)); Monopoly and Monopsonic Power (Berger et al. (2019), Edmond et al. (2015), De Loecker et al. (2020)); Trade Liberalization (Cosar et al. (2016), Kambourov (2009)); Development and Firm Size (Poschke (2018), Bento and Restuccia (2017), Hsieh and Klenow (2014)); Informality (Ulyssea (2018), D'Erasmo and Moscoso Boedo (2012)); Start-ups and Firm Growth (Sterk et al. (2021), Sedláček and Sterk (2017)); Entrepreneurship and Inequality (Allub and Erosa, 2019); Size-dependent Policies (Guner et al. (2008), Garicano et al. (2016)), Microfinance (Buera et al., 2021); Large Firms and Granularity (Carvalho and Grassi (2019), di Giovanni and Levchenko (2012)); Firm and Employment Dynamics (Decker et al. (2014), Bachmann et al. (2020)); Consumer Capital (Gourio and Rudanko, 2014); Manager Heterogeneity (Guner et al. (2018), Akcigit et al. (2021)); Wealth Taxation (Guvenen et al., 2019); Banking Industry Dynamics (Corbae and D'Erasmo, 2021).

3. **Dados em modelos macroecônomicos: *calibration*, *estimation*, e outros tópicos.**

   (a) Conhecimento "escondido": uma discussão (honesta) sobre *calibration*, *estimation*, e *indirect inference* em modelos macro. Nakamura and Steinsson (2018)*, Canova (2007, ch. 7).

   (b) Evidência causal regional e *missing intercept problem*. Chodorow-Reich (2020), Wolf (2019), Guren et al. (2021).

4. **Resolvendo Modelos em Tempo Contínuo.**

   (a) Programação Dinâmica e Incerteza em Tempo Contínuo. Stokey (2020, The Economics of Inaction).

   (b) *Finite difference method*. Achdou et al. (2021)*, Ahn et al. (2017).

5. **HANK: Heterogeneous Agent New Keynesian.**

   (a) Modelos Analíticos. Acharya and Dogra (2020), Bilbiie (2021).

   (b) Modelos Quantitativos. Kaplan et al. (2018)*, Kaplan and Violante (2018)*, Auclert (2019), McKay et al. (2016).

   (c) Métodos Computacionais: Auclert et al. (2021), Bayer and Luetticke (2020).

   (d) **Outras Aplicações**: Fiscal Policy (Hagedorn et al. (2019), Auclert et al. (2018); Heterogeneous Porfolios (Luetticke, 2021); Open Economies (Auclert et al., 2021); Automatic Stabilizers (McKay and Reis, 2016); Search Frictions (Ravn and Sterk, 2021).

Referências

Abbott, B., G. Gallipoli, C. Meghir, and G. L. Violante (2019). Education policy and intergenerational transfers in equilibrium. *Journal of Political Economy 127*(6), 2569–2624.

Acharya, S. and K. Dogra (2020). Understanding HANK: Insights From a PRANK. *Econometrica 88*(3), 1113–1158.

Achdou, Y., J. Han, J.-M. Lasry, P.-L. Lions, and B. Moll (2021). Income and Wealth Distribution in Macroeconomics: A Continuous-Time Approach. *The Review of Economic Studies*.

Ahn, S., G. Kaplan, B. Moll, T. Winberry, and C. Wolf (2017). When Inequality Matters for Macro and Macro Matters for Inequality. In *NBER Macroeconomics Annual*, pp. 1–75.

Aiyagari, R. (1994). Uninsured idiosyncratic risk and aggregate savings. *Quarterly Journal of Economics 109*(3), 659–684.

Akcigit, U., H. Alp, and M. Peters (2021). Lack of selection and limits to delegation: firm dynamics in developing countries. *American Economic Review 111*(1), 231–275.

Akcigit, U. and W. R. Kerr (2018). Growth through heterogeneous innovations. *Journal of Political Economy 126*(4).

Algan, Y., O. Allais, W. J. Den Haan, and P. Rendahl (2014). *Solving and Simulating Models with Heterogeneous Agents and Aggregate Uncertainty*, Volume 3. Elsevier B.V.

Allub, L. and A. Erosa (2019). Financial frictions, occupational choice and economic inequality. *Journal of Monetary Economics 107*, 63–76.

Auclert, A. (2019). Monetary policy and the redistribution channel. *American Economic Review 109*(6), 2333–2367.

Auclert, A., M. Rognlie, M. Souchier, and L. Straub (2021). Exchange Rates and Monetary Policy With Heterogeneous Agents: Sizing Up the Real Income Channel.

Auclert, A., M. Rognlie, and L. Straub (2018). THE INTERTEMPORAL KEYNESIAN CROSS.

Bachmann, R. and C. Bayer (2013). 'Wait-and-See' business cycles? *Journal of Monetary Economics 60*(6), 704–719.

Bachmann, R., C. Bayer, C. Merkl, S. Seth, H. Stüber, and F. Wellschmied (2020). Worker churn in the cross section and over time: New evidence from Germany. *Journal of Monetary Economics 117*(282740), 781–797.

Barczyk, D. and M. Kredler (2018). Evaluating long-term-care policy options, taking the family seriously. *Review of Economic Studies 85*(2), 766–809.

Bayer, C. and R. Luetticke (2020). Solving discrete time heterogeneous agent models with aggregate risk and many idiosyncratic states by perturbation. *Quantitative Economics 11*(4), 1253–1288.

Bayer, C., R. Luetticke, L. Pham-Dao, and V. Tjaden (2019). Precautionary Savings, Illiquid Assets, and the Aggregate Consequences of Shocks to Household Income Risk. *Econometrica 87*(1), 255–290.

Bento, P. and D. Restuccia (2017). Misallocation, establishment size, and productivity. *American Economic Journal: Macroeconomics 9*(3), 267–303.

Berger, D. W., K. F. Herkenhoff, and S. Mongey (2019). Labor Market Power. *NBER Working Paper*, No. 25719.

Bilbiie, F. O. (2021). Monetary Policy and Heterogeneity: An Analytical Framework.

Bils, M., Y. Chang, and S.-b. Kim (2011). Worker Heterogeneity and Endogenous Separations in a Matching Model of Unemployment Fluctuations. *American Economic Journal: Macroeconomics 3*(January), 128–154.

Bloom, N. (2009). The Impact of Uncertainty Shocks. *Econometrica 77*(3), 623–685.

Bloom, N., M. Floetotto, N. Jaimovich, I. Saporta-eksten, and S. J. Terry (2018). Really Uncertain Business Cycles. *Econometrica 86*(3), 1031–1065.

Boar, C. and Virgilu Midrigan (2020). Efficient Redistribution. (July), 54.

Boppart, T., P. Krusell, and K. Mitman (2018). Exploiting MIT shocks in heterogeneous-agent economies: the impulse response as a numerical derivative. *Journal of Economic Dynamics and Control 89*, 68–92.

Buera, F. J., J. P. Kaboski, and Y. Shin (2011). Finance and development: A tale of two sectors. *American Economic Review 101*(5), 1964–2002.

Buera, F. J., J. P. Kaboski, and Y. Shin (2021). The Macroeconomics of Microfinance. *The Review of Economic Studies 88*(1), 126–161.

Carvalho, V. M. and B. Grassi (2019). Large firm dynamics and the business cycle. *American Economic Review 109*(4), 1375–1425.

Chatterjee, S., D. Corbae, M. Nakajima, and J. V. Rios-Rull (2007). A Quantitative Theory of Unsecured Consumer Credit with Risk of Default. *Econometrica 75*(6), 1525–1589.

Chodorow-Reich, G. (2020). Regional data in macroeconomics: Some advice for practitioners. *Journal of Economic Dynamics and Control 115*, 1–14.

Clementi, G. L. and B. Palazzo (2016). Entry, Exit, Firm Dynamics, and Aggregate Fluctuations. *American Economic Journal: Applied Economics 8*(3), 1–41.

Conesa, J. C., S. Kitao, and D. Krueger (2009). Taxing capital? not a bad idea after all! *American Economic Review 99*(1), 25–48.

Conesa, J. C. and D. Krueger (1999). Social Security Reform with Heterogeneous Agents. *Review of Economic Dynamics 2*, 757–795.

Corbae, D. and P. D'Erasmo (2021). Capital Requirements in a Quantitative Model of Banking Industry Dynamics.

Cosar, A. K., N. Guner, and J. Tybout (2016). Firms Dynamics, Job Turnover, and Wages Distribution in an Open Economy. *American Economic Review 106*(3), 625–663.

De Loecker, J., J. Eeckhout, and G. Under (2020). The Rise of Market Power and the Macroeconomics Implications. *Quarterly Journal of Economics 135*(2), 561–644.

De Nardi, M. and G. Fella (2017). Saving and wealth inequality. *Review of Economic Dynamics 26*, 280–300.

De Nardi, M., G. Fella, and G. Paz-Pardo (2020). Nonlinear Household Earnings Dynamics, Self-Insurance, and Welfare. *Journal of the European Economic Association 18*(2), 890–926.

Decker, R., J. Haltiwanger, R. Jarmin, and J. Miranda (2014). The Role of Entrepreneurship in US Job Creation and Economic Dynamism. *Journal of Economic Perspectives 28*(3), 3–24.

D'Erasmo, P. N. and H. J. Moscoso Boedo (2012). Financial structure, informality and development. *Journal of Monetary Economics 59*(3), 286–302.

di Giovanni, J. and A. A. Levchenko (2012). Country size, international trade, and aggregate fluctuations in granular economies. *Journal of Political Economy 120*(6), 1083–1132.

Edmond, C., V. Midrigan, and D. Y. Xu (2015). Competition, Markups, and the Gains from International Trade. *American Economic Review 105*(10), 3183–3221.

Fuster, L., A. Imrohoroğlu, and S. Imrohoroğlu (2007). Elimination of social security in a dynastic framework. *Review of Economic Studies 74*, 113–145.

Garicano, L., C. Lelarge, and J. Van Reenen (2016). Firm size distortions and the productivity distribution: Evidence from France. *American Economic Review 106*(11), 3439–3479.

Gourio, F. and L. Rudanko (2014). Customer capital. *Review of Economic Studies 81*(3), 1102–1136.

Greenwood, J., N. Guner, G. Kocharkov, and C. Santos (2016). Technology and the changing family: A unified model of marriage, divorce, educational attainment, and married female labor-force participation. *American Economic Journal: Macroeconomics 8*(1), 1–41.

Guner, N., A. Parkhomenko, and G. Ventura (2018). Managers and productivity differences. *Review of Economic Dynamics 29*, 256–282.

Guner, N., G. Ventura, and Y. Xu (2008). Macroeconomic implications of size-dependent policies. *Review of Economic Dynamics 11*, 721–744.

Guren, A., A. McKay, E. Nakamura, and J. Steinsson (2021). *What do we learn from cross-regional empirical estimates in macroeconomics?*, Volume 35.

Guvenen, F. (2011). Macroeconomics with Heterogeneity: A Practical Guide. *Economic Quarterly 97*(3), 255–326.

Guvenen, F., G. Kambourov, B. Kuruscu, S. Ocampo-diaz, and D. Chen (2019). Use it or Lose it: Efficiency Gains from Wealth Taxation.

Guvenen, F., B. Kuruscu, and S. Ozkan (2014). Taxation of Human Capital and Wage Inequality: A Cross-Country Analysis. *Review of Economic Studies* (81), 818–850.

Hagedorn, M., I. Manovskii, and K. Mitman (2019). The Fiscal Multiplier.

Heathcote, J., K. Storesletten, and G. L. Violante (2009). Quantitative Macroeconomics with Heterogeneous Households. *Annual Review of Economics 1*(1), 319–354.

Heathcote, J., K. Storesletten, and G. L. Violante (2010). The Macroeconomic Implications of Rising Wage Inequality in the United States. *Journal of Political Economy 118*(4), 681–722.

Heathcote, J., K. Storesletten, and G. L. Violante (2020). Optimal progressivity with age-dependent taxation. *Journal of Public Economics 189*, 104074.

Hopenhayn, H. (1992). Entry, Exit, and firm Dynamics in Long Run Equilibrium. *Econometrica 60*(5), 1127–1150.

Hopenhayn, H. and R. Rogerson (1993). Job Turnover and Policy Evaluation: A General Equilibrium Analysis. *Journal of Political Economy 101*(5), 915–938.

Hopenhayn, H. A. (2014). *Firms, misallocation, and aggregate productivity: A review*, Volume 6.

Hsieh, C.-T. and P. J. Klenow (2009). Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics CXXIV*(4), 1403–1448.

Hsieh, C.-T. and P. J. Klenow (2014). The Life Cycle of Plants in India and Mexico. *Quarterly Journal of Economics 129*(3), 1035–1084.

Huggett, M., G. Ventura, and A. Yaron (2011). Sources of lifetime inequality. *American Economic Review 101*(December), 2923–2954.

Kambourov, G. (2009). Labour market regulations and the sectoral reallocation of workers: The case of trade reforms. *Review of Economic Studies 76*(4), 1321–1358.

Kaplan, G., B. Moll, and G. L. Violante (2018). Monetary Policy According to HANK. *American Economic Review 108*(3), 697–743.

Kaplan, G. and G. L. Violante (2010). How Much Consumption Insurance Beyond Self-Insurance? *American Economic Journal: Macroeconomics 2*, 53–87.

Kaplan, G. and G. L. Violante (2014). A Model of the Consumption Response to Fiscal Stimulus Payments. *Econometrica 82*(4), 1199–1239.

Kaplan, G. and G. L. Violante (2018). Microeconomic heterogeneity and macroeconomic shocks. *Journal of Economic Perspectives 32*(3), 167–194.

Khan, A. and J. K. Thomas (2008). Idiosyncratic Shocks and the Role of Nonconvexities in Plant and Aggregate Investment Dynamics. *Econometrica 76*(2), 395–436.

Klette, T. J. and S. Kortum (2004). Innovating firms and aggregate innovation. *Journal of Political Economy 112*(5), 986–1018.

Krueger, D., K. Mitman, and F. Perri (2016). Macroeconomics and Household Heterogeneity. In *Handbook of Macroeconomics* (1 ed.), Volume 2, pp. 843–921. Elsevier B.V.

Krueger, D. and F. Perri (2006). Does Income Inequality Lead to Consumption Inequality? Evidence and Theory. *Review of Economic Studies 73*, 163–193.

Krusell, P., T. Mukoyama, and A. Sahin (2010). Labour-market matching with precautionary savings and aggregate fluctuations. *Review of Economic Studies 77*(4), 1477–1507.

Krusell, P. and A. A. Smith (1998). Income and wealth heterogeneity in the macroeconomy. *Journal of Political Economy 106*(5), 867–896.

Livshits, B. I., J. Macgee, and M. Tertilt (2007). Consumer Bankruptcy: A Fresh Start. *American Economic Review 97*(1), 402–418.

Lochner, B. L. J. and A. Monge-naranjo (2011). The Nature of Credit Constraints and Human Capital. *American Economic Review 101*(6), 2487–2529.

Low, H., C. Meghir, and L. Pistaferri (2010). Wage Risk and Employment Risk over the Life Cycle. *American Economic Review 100*(4), 1432–1467.

Luetticke, R. (2021). Transmission of Monetary Policy with Heterogeneity in Household Portfolios. *American Economic Journal: Macroeconomics 13*(2), 1–25.

McKay, A. (2017). Time-varying idiosyncratic risk and aggregate consumption dynamics. *Journal of Monetary Economics 88*, 1–14.

McKay, A., E. Nakamura, and J. Steinsson (2016). The power of forward guidance revisited. *American Economic Review 106*(10), 3133–3158.

McKay, A. and R. Reis (2016). The Role of Automatic Stabilizers in the U.S. Business Cycle. *Econometrica 84*(1), 141–194.

Melitz, M. J. (2003). The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica 71*(6), 1695–1725.

Midrigan, V. and D. Y. Xu (2014). Finance and Misallocation : Evidence from Plant-Level Data. *American Economic Review 104*(2), 422–458.

Nakajima, M. (2012). Business Cycles in the Equilibrium Model of Labor Market Search and Self-Insurance. *International Economic Review 53*(2), 399–432.

Nakamura, E. and J. Steinsson (2018). Identification in macroeconomics. *Journal of Economic Perspectives 32*(3), 59–86.

Poschke, M. (2018). The firm size distribution across countries and skill-biased change in entrepreneurial technology. *American Economic Journal: Macroeconomics 10*(3), 1–41.

Quadrini, V. (2000). Entrepreneurship, Saving, and Social Mobility. *Review of Economic Dynamics 3*(1), 1–40.

Ravn, M. O. and V. Sterk (2021). Macroeconomic Fluctuations with HANK and SAM: An Analytical Approach. *Journal of the European Economic Association 19*(2), 1162–1202.

Restuccia, D. and R. Rogerson (2008). Policy distortions and aggregate productivity with heterogeneous establishments. *Review of Economic Dynamics 11*, 707–720.

Restuccia, D. and R. Rogerson (2017). The Causes and Costs of Misallocation. *Journal of Economic Perspectives 31*(3), 151–174.

Sedláček, P. and V. Sterk (2017). The growth potential of startups over the business cycle. *American Economic Review 107*(10), 3182–3210.

Sterk, V., P. Sedláček, and B. Pugsley (2021). The Nature of Firm Growth. *American Economic Review 111*(2), 547–579.

Storesletten, K., C. I. Telmer, and A. Yaron (2004). Consumption and risk sharing over the life cycle. *Journal of Monetary Economics 51*(3), 609–633.

Terry, S. J. (2017). Alternative Methods for Solving Heterogeneous Firm Models. *Journal of Money, Credit and Banking 49*(6).

Ulyssea, G. (2018). Firms, Informality, and Development: Theory and Evidence from Brazil. *American Economic Review 108*(8), 2015–2047.

Voena, A. (2015). Yours, Mine, and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples? *American Economic Review 105*(8), 2295–2332.

Wellschmied, F. (2021). The welfare effects of asset mean-testing income support. *Quantitative Economics 12*(1), 217–249.

Winberry, T. (2018). A method for solving and estimating heterogeneous agent. *Quantitative Economics 9*, 1123–1151.

Wolf, C. K. (2019). The Missing Intercept: A Demand Equivalence Approach. pp. 1–109.