Government Ownership of IMF Conditionality Programs: A Formal Derivation

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When a country borrows from the IMF, its government agrees to adjust its economic policies to address the macroeconomic imbalances that led it to seek financial aid. These policy adjustments are conditions for IMF loans and serve to ensure that the country will be able to repay the IMF. This system of ***conditionality*** *is designed to promote* ***national ownership*** *of strong and effective policies (IMF 2019).*

Outline of this talk

The official IMF view of ownership

Ownership is defined as "a **willing assumption of responsibility** for an agreed program of policies, by officials in a borrowing country who have the responsibility to formulate and carry out those policies, based on an understanding that the program is achievable and is in the country's own interest" (IMF, 2001: 6).

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It is based on the following set of assumptions:

i. There should be **no conflict of interests** between the IMF and the borrowing government in an environment of common beliefs and shared (*ex ante* and *ex post*) preferences.
ii. The government "**shares with the IMF** both the objectives of the program and an understanding of the appropriate economic model linking those objectives to economic policy" (Khan and Sharma 2003, 235).
iii. The IMF **trusts** in the target government's willingness and/or ability to comply, reform, and repay its loans.

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This conundrum is due to the presumption of such "loans-for-reforms" contracts as **complete**.

Conditionality as an incomplete contract

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Conditionality arrangements as **asymmetric incentive schemes** (Dixit, 2000) and **incomplete contracts** (Hart and Holmström, 1987):

i. Observability of reforms at different stages of implementation
ii. Hidden action and moral hazard
iii. Differential monitoring costs
iv. Uncertainty over the effects of country default

Functions of conditionality

Conditionality as a necessary consequence of the ***ex ante* asymmetry** and **incompleteness** of such contracts:

i. Confidence-building measures (Beazer and Woo, 2016)
ii. Commitment devices (Candel-Sánchez, 2021; Diwan and Rodrik, 1992)
iii. Costly signals (IMF, 2001)
iv. Domestic agenda-setting tools (Drazen, 2002)
v. Expert policy recommendations (Drazen and Isard, 2004)
vi. Rhetorical ploys of cheap talk (Vreeland, 2003)

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Without prior knowledge over which one(s) of the function(s) listed above the design of any conditionality program is supposed to serve, **ownership is not directly observable or measurable** either *ex ante* or *ex post*.

Our research objectives

1. We first propose a systematic attempt at formalizing, identifying, and operationalizing the concept of ownership.

2. We then validate that measure against specific cases and qualitative evidence.

The political economy of IFI lending

Domestic factors/ Systemic factors $\xrightarrow{\text{(a)}}$ **Program design (conditionality)** $\xrightarrow{\text{(b)}}$ **Policy outcomes/ *De facto* program implementation**

a. Program design influenced by *domestic* (e.g., Nelson, 2014; Rickard and Caraway, 2014) and *systemic* factors (e.g., Copelovitch, 2010; Dreher et al., 2015; Gould, 2003; Stone, 2008)

b. Effects on socioeconomic development (Stiglitz, 2004; Vreeland, 2007), macroeconomic outcomes (Bas and Stone, 2014), and *de facto* compliance (Killick, 1997; Reinsberg et al., 2019)

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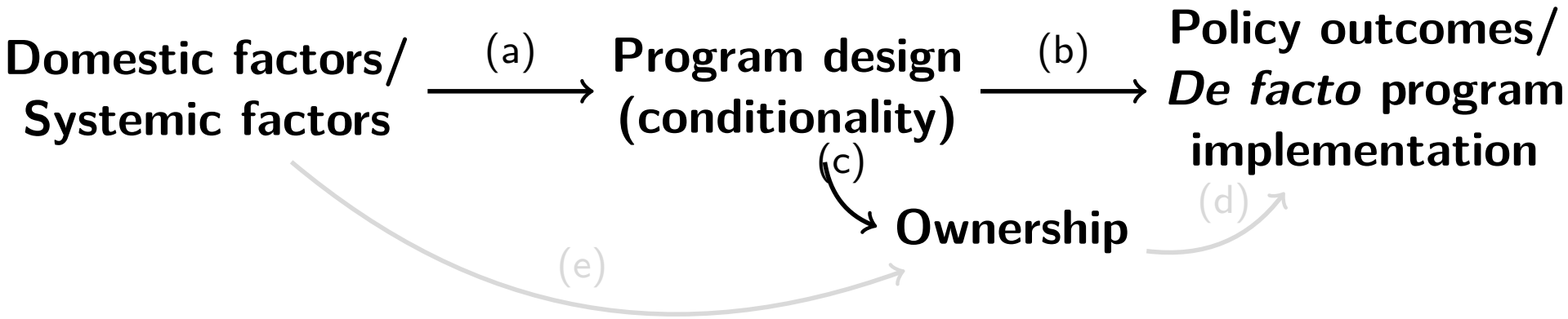

- Political economy models of special interest politics and common agency
- Ownership and *de facto* implementation (Bird and Willett, 2004; Henisz and Mansfield, 2019)
- Indirect proxies of countries' "willingness to reform" (Wei and Zhang, 2010)

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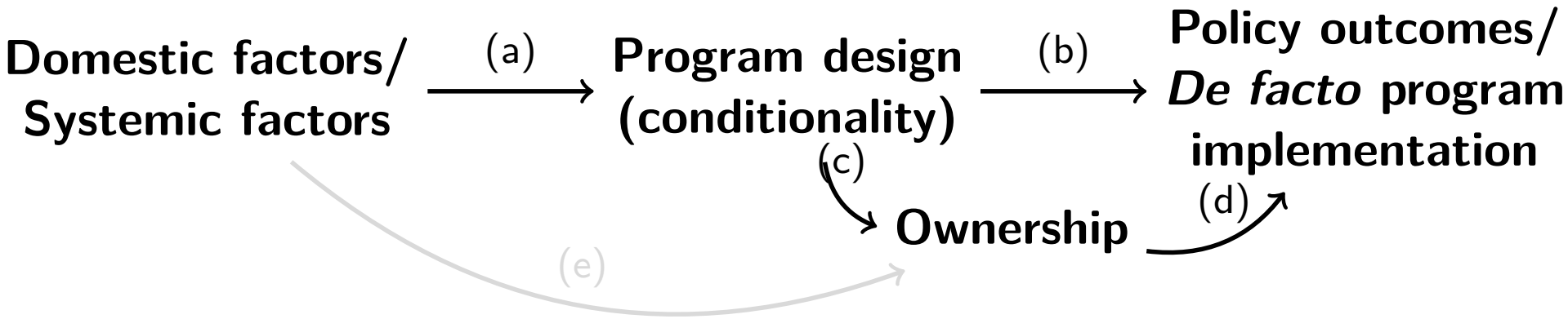

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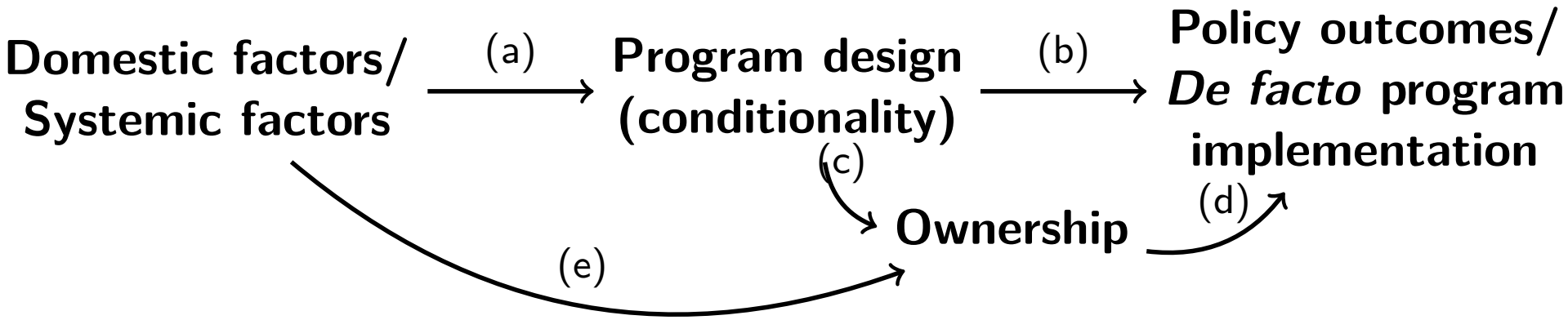

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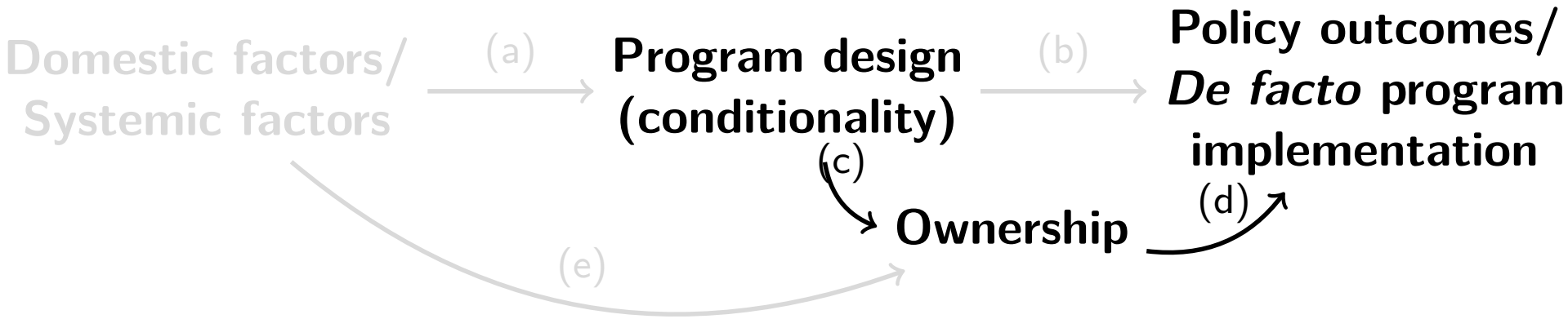

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A counterfactual model of ownership

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- Let $x^j_{i,t} \in \mathbb{R}^+$ denote country i's sector-specific level of **liberalization** modeled along a unidimensional scale.
- Let $r^j_{i,t} = x^j_{i,t} - x^j_{i,t-1} \geq 0$ denote the country's level of **policy adjustment** in period t through the enactment of *de jure* reforms in policy area j.

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- Let $R_{i,t} = \left[r^j_{i,t}\right]_{j=1}^{J}$ denote the economy-wide reform package implemented in period t across the full range of policy areas J.

A counterfactual model of ownership cntd.

- An initial IO-sponsored **loan program** $P_{i,T}\left(L_{i,T}; C_{i,T}\right)$ of time-length T for country i comes into force, i.e., $e_{i,0} = 1$, at time $t = 0$.

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- It comprises a pre-specified schedule of **financial loan tranches and repayments** $L_{i,T} = (l_{i,0}, l_{i,1}, \ldots, l_{i,T})$ and a **structural adjustment program** $C_{i,T} = \left[c^j_{i,t}\right]^{t=0,\ldots,T}_{j=1,\ldots,J}$, where $c^j_{i,t} \in \{0,1\}$ and $x^j_{i,-1} \leq \underline{x}^j_{i,0} \leq \ldots \leq \underline{x}^j_{i,T}$ (with at least one strict $<$) if $c^j_{it} = 1$.

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- The government is in **compliance** with P_{iT} at the end of review cycle t, i.e., $m^j_{i,t} = 1$ if, and only if, $x^j_{i,t} \geq \underline{x}^j_{i,t}$ for all $j \in \underline{J}_{i,T}$.

Latent government preferences

Latent government preferences over (constrained or unconstrained) structural reform packages $P_{i,T}\left(L_{i,T}; C_{i,T}\right)$ are modeled through a quasi-concave, continuous, and twice differentiable reduced-form **political support function**, which amounts to a weighted average between general welfare and financial contributions from special interests, i.e.,

$$g\left(X_{i,t}, L_{i,T} | D_{i,t}, S_t\right) = \beta y(X_{i,t}, L_{i,T}) + (1-\beta)s(X_{i,t})$$

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We adopt a **"revealed-preferences" approach** to extrapolate the utility cost of abiding by the structural adjustment program $C_{i,T}$.

Government ownership (α) as a "shadow price"

Formally, government ownership is reflected by the **"shadow price" (Lagrange multiplier)** $\alpha_{i,t}$ of the conditionality constraint on the incumbent's latent political support, i.e.,

$$\max_{X_{i,t} \in \mathbb{R}^{+J}} g\left(X_{i,t}, L_i; D_{i,t}, S_t\right) \text{ s.t. } x^j_{i,t} \geq \underline{x}^j_{i,t} \text{ for all } j \in \underline{J}_{i,T} \text{ and} \tag{CM}$$

$$\alpha_{i,t} = \left[\lambda^j_{i,t}\right]_{j \in \underline{J}_{i,T}} = \left[\frac{d\, g\left(X^*_{i,t}, L_{i,T} | D_{i,t}, S_t\right)}{d\, \underline{x}^j_{i,t}}\right]_{j \in \underline{J}_{i,T}} < 0. \tag{LM}$$

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Moreover, we posit that the optimal level of ***de facto* reforms** $Z_{i,t} = \left[z^j_{i,t}\right]_{j=1}^{J} \in \mathbb{R}^{+J}$ will be a function of local ownership insofar as

$$\frac{d\, z^{j*}_{i,t}}{d\, |\alpha_{i,t}|} < 0 \text{ for all } j \in \underline{J}_{i,T}.$$

Identifying ownership

Assuming that country i has selected into $(e_{i,0} = 1)$ and complied with $\left(m^j_{i,t} = 1\right)$ a binary treatment of sector-specific conditionality at time $t = 0$, we identify government i's ownership over the conditional adjustment program in sector j and period t as a function of a time-varying **"treatment effect on treated compliers" (TETC)**, i.e.,

$$x^{j1*}_{i,t}\left(L_i, \left(C^{-j}_{i,T}, 1\right) | D_{i,t}, S_t\right) - x^{j0*}_{i,t}\left(L_i, \left(C^{-j}_{i,T}, 0\right) | D_{i,t}, S_t\right) | e_{i,0} = m^j_{i,t} = 1. \quad \text{(TETC)}$$

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Here, $x^{j1*}_{i,t} \in \text{argmax}_{X_{i,t}}\ g\left(X_{i,t}, L_{i,T}|D_{i,t}, S_t\right)$ s.t. $c^j_{i,t} = 1$ reflects the **(observed) *actual* support-maximizing level of *de jure* liberalization** for the treated unit, and $x^{j0*}_{i,t} \in \text{argmax}_{X_{i,t}}\ g\left(X_{i,t}, L_{i,T}|D_{i,t}, S_t\right)$ s.t. $c^j_{i,0} = 0$ captures the **(unobserved) counterfactual support-maximizing level of *de jure* liberalization** for the same unit in the absence of the sector-specific conditionality treatment.

The synthetic control method (SCM)

The **synthetic control method (SCM)** (Abadie and Gardeazabal, 2003; Abadie et al., 2010, 2015) estimates the effect of an intervention (treatment) at time $t = 0$ by comparing the evolution of an aggregate outcome for a unit affected by the intervention to the evolution of the same aggregate outcome for a synthetic control group.

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We apply the SCM method to identify the **counterfactual** of what would be observed for the affected unit in the absence of the intervention, i.e., $x_{i,t}^{j0*} | e_{i,t}^{j} = m_{i,t}^{j} = 1$.

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In other words, SCM allows us to determine whether the actual rate of reforms is indeed **incentive-compatible**.

Measures of ownership

(i) A target government's $i \in I$ *yearly* level of ownership of an IO-mandated **level** of sector-specific liberalization is captured by the following year-level measure:

$$\widehat{\alpha}^{j}_{i,t} = -\frac{\left| x^{j}_{i,t} - \sum_{k \in K} w^{*}_{k} x^{j}_{k,t} \right|}{\sum_{k \in K} w^{*}_{k} x^{j}_{k,t}}.$$

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(ii) Our *second* measure is estimated with respect to the post-treatment goodness of fit between *actual* and *counterfactual de jure* policy outcomes. A target government i's ownership over the **timing** and **sequencing** of conditional reforms at time $t = 0$ is directly proportional to minus the **root mean square prediction error (RMSPE)**, i.e.,

$$\widehat{\rho}^{j}_{i} = -\frac{1}{T}\left(\sum_{t=1}^{T}\left(\widehat{\alpha}^{j}_{i,t}\right)^{2}\right)^{1/2} = -\frac{1}{T}\left(\sum_{t=1}^{T}\left(\frac{x^{j}_{i,t} - \sum_{k \in K} w^{*}_{k} x^{j}_{k,t}}{\sum_{k \in K} w^{*}_{k} x^{j}_{k,t}}\right)^{2}\right)^{1/2}.$$

External- and financial-sector conditionality

We apply SCM to all **uninterrupted** IMF arrangements (1980-2014) with at least one **external-** (current and capital account liberalization) or **financial-sector** (banking reform, regulatory oversight) condition:

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- Outcome variable $x^{j}_{i,t}$: KOF index of *de jure* economic globalization (Dreher, 2006; Gygli et al., 2019)
- Policy intervention: EXT or FIN structural conditions $(\#SPCs + \#PAs > 0)$ signed at time $t = 0$ and enforced throughout $T = 4$
- Pool of treated countries (I): all uninterrupted programs that received IMF conditions in either sector with a gap of at least five years from the last active program (32 cases)
- Donor pool of control units (K): all IMF arrangements beginning in any year but without the respective structural conditionality
- Predictors: pre-treatment outcomes and *domestic*/*systemic* macroeconomic, political, and security variables

Robustness of our measures

Alternative **donor-pool specifications**:

1. All IMF programs without the same sectoral conditionality starting in the same year as the treated unit
2. All untreated observations not under an IMF program matching on the propensity score of being under an IMF program
3. All untreated observations matching on the propensity score of receiving the treatment through a selection model for IMF programs
4. All IMF programs without the same sectoral conditionality excluding countries from the same region

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For a total of B bootstrap iterations, we perform the SCM approach using a (smaller) subsample of potential control cases obtained through **resampling with replacement** from the entire donor pool.

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For a total of B bootstrap iterations, we perform the SCM approach using a (smaller) subsample of potential control cases obtained through **resampling with replacement** from the entire donor pool.

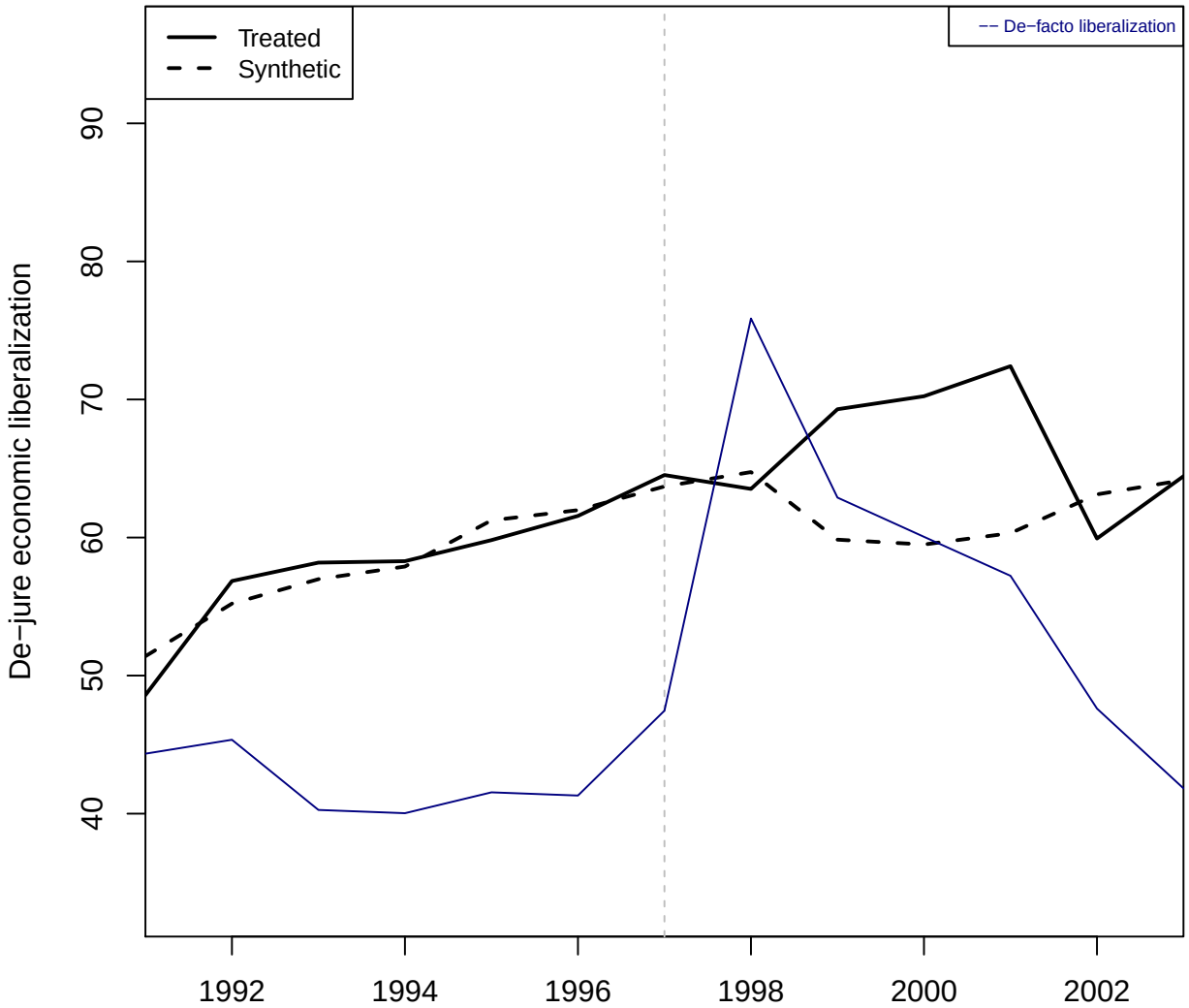
The 90th-percentile **upper confidence band** based on the standard error of the empirical distribution of point estimates is

$$\bar{x}^{j}_{k,t} + 1.645 \sqrt{\frac{1}{B} \sum_{b=1}^{B} \left(\hat{x}^{j}_{b,t} - \bar{x}^{j}_{k,t} \right)^2}, \tag{1}$$

where $\bar{x}^{j}_{k,t}$ is the mean policy outcome estimate.

The case of Indonesia (1997-2003)

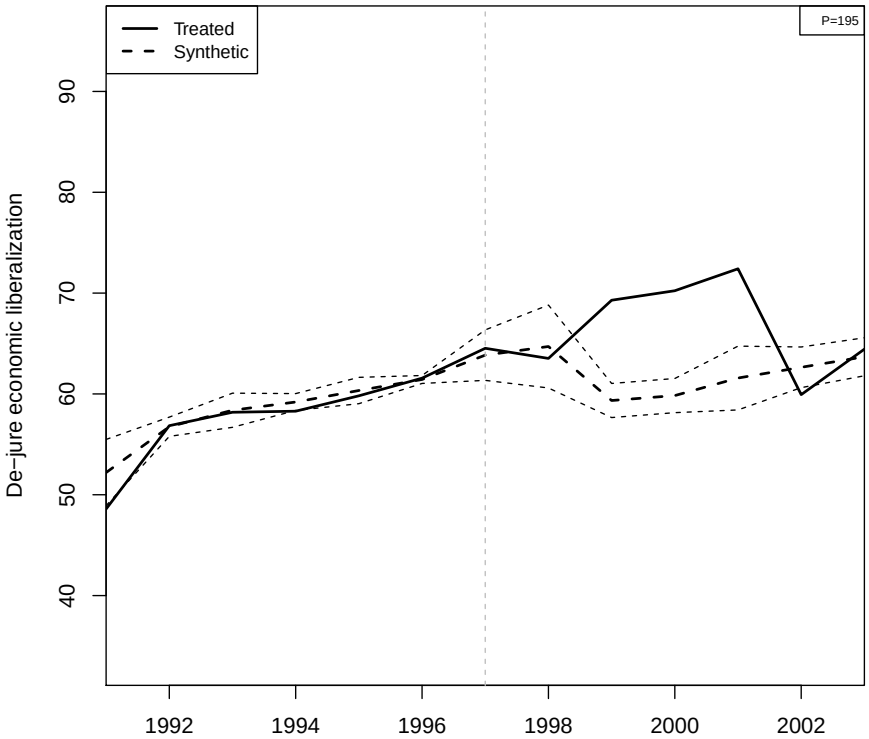
Year-level ownership and *de facto* policy implementation



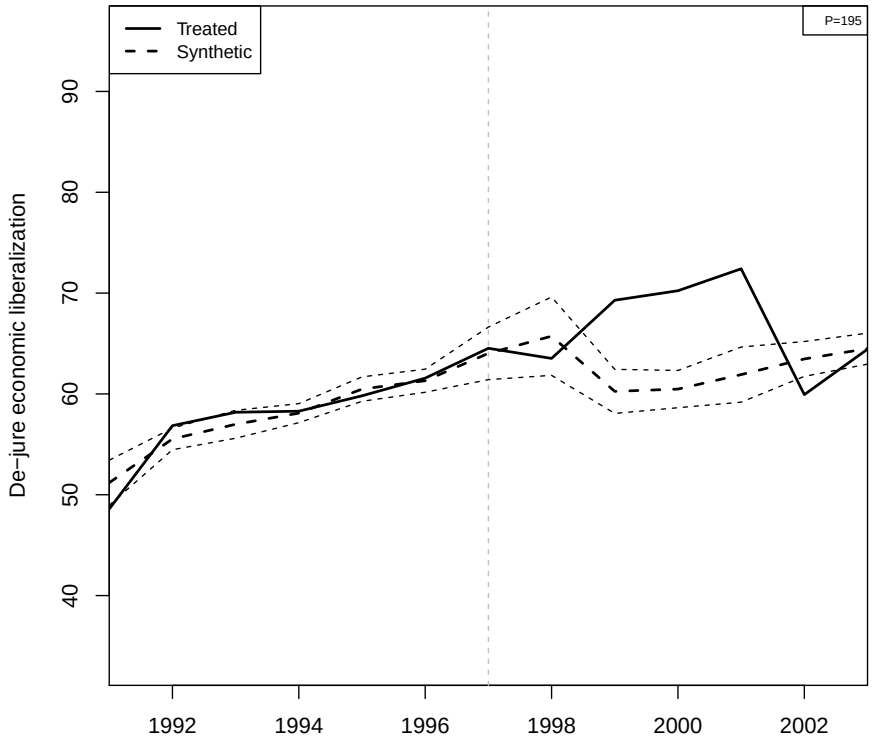
Covariate weights

Covariates	Weight
GDP per capita	0.009
Population	0.021
State capacity	0.006
Political globalization	0.000
GDP growth	0.000
Reserves	0.005
Current account	0.010
Debt service	0.047
Fuel exports	0.016
Veto player index	0.011
Past conflict	0.071
Military expenditure	0.001
Total conditions	0.000
Scope of conditionality	0.058
Pre-treatment outcome (t-1)	0.400
Pre-treatment outcome (t-5)	0.328
Trade openness (t-1)	0.013
Countries under programs (t-1)	0.002

Inclusion of additional control variables



(a) Political (in)stability controls.



(b) Business cycle controls.

Figure: Paths of *de jure* economic globalization in actual and synthetic Indonesia (1997) for additional controls.

Placebo test for Indonesia (1997-2003)

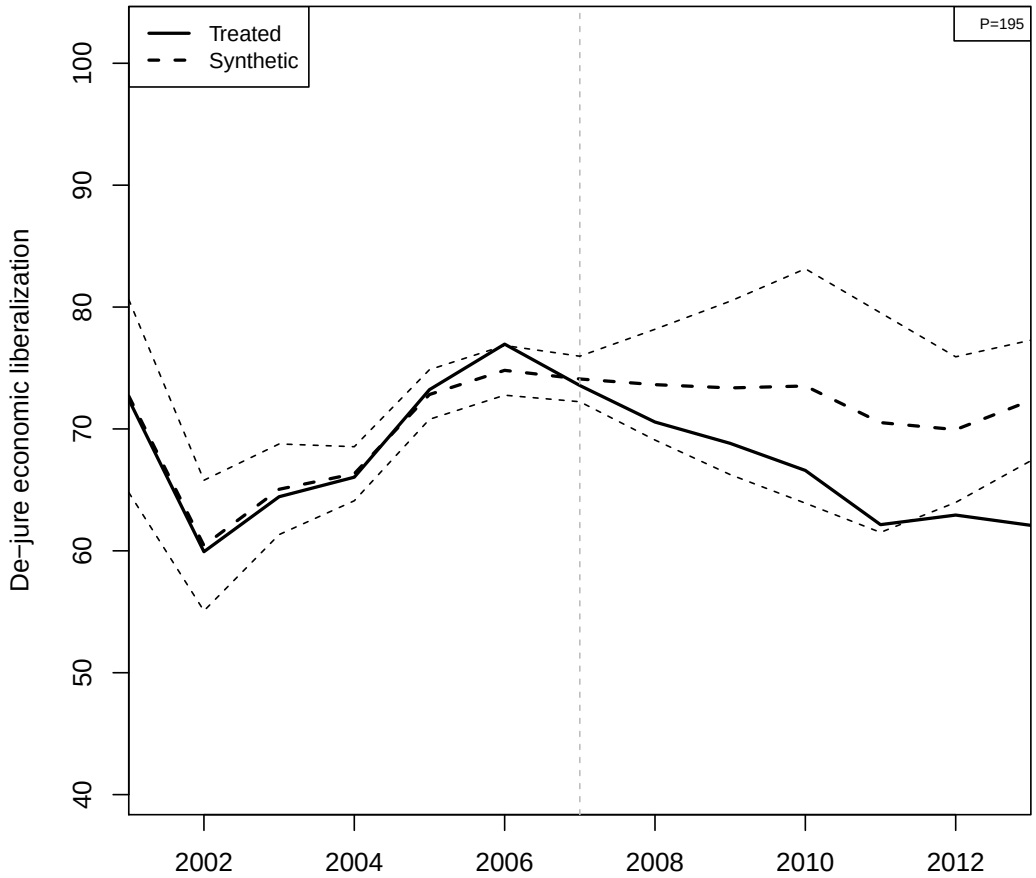


Figure: Placebo test "pretending" the treatment kicked in 10 years later.

Summary and future work

What we have done:

- We propose counterfactual-based measures of government ownership as a latent mediating variable between program design and policy implementation.
- In another paper, we systematically operationalize our measures through the SCM method and validate them across a restricted sample of uninterrupted IMF arrangements (1980-2014).

Summary and future work

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- We propose counterfactual-based measures of government ownership as a latent mediating variable between program design and policy implementation.
- In another paper, we systematically operationalize our measures through the SCM method and validate them across a restricted sample of uninterrupted IMF arrangements (1980-2014).

What we intend to do:

- Collect and operationalize more sector-specific compliance data.
- Perform instrumental variable analysis and causal mediation analysis controlling for two-sided imperfect compliance.
- Develop a full principal-agent model to account for multiple tasks and multidimensional reform packages.

Thank you for your attention!